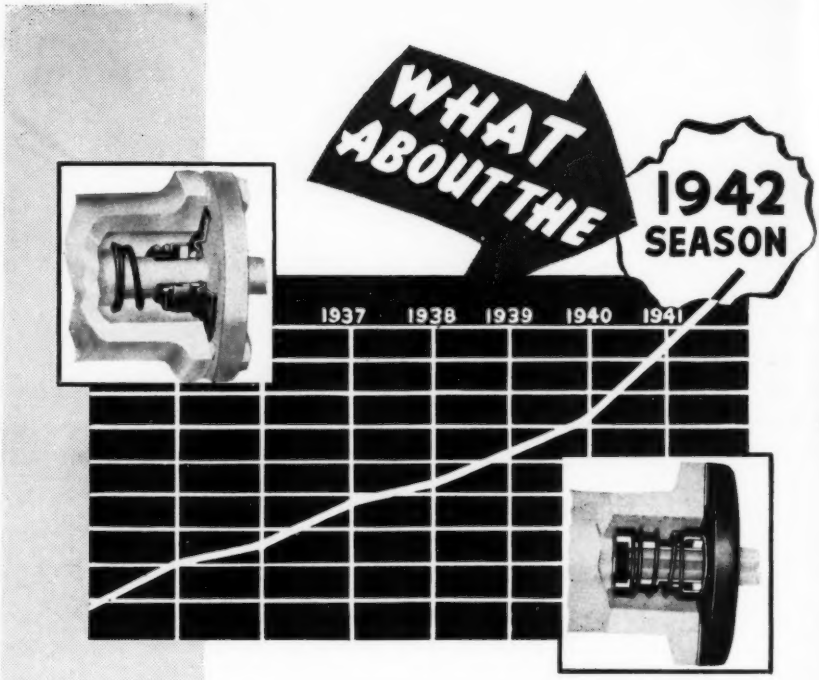
Refrigeration Service Engineer

CHNOLOGY DEPT.
VOL. 10 NO. 3 ★ ★ ★ MARCH · 1942
MAR 18 1942
DETROIT

Welding Steel Fram
of Freezer Cabinet



VOLUME OF SERVICE WORK IN 1942 WILL BE UP AGAIN

As each week passes, the demand to keep equipment in operation, which under normal conditions would be replaced, will increase. To keep pace with the rising tide of service work, you must keep plenty of the best materials and parts available on hand.

Rotary Seal Replacement Units are vital to your business. Be ready to handle the service work which will come your way. Right now is the time to put in your stock of Rotary Seal Units.

ROTARY SEAL COMPANY

2020 North Larrabee St. • Chicago, Ill.

Canadian Office 382 Victoria Avenue, Westmount, Montreal

THE REFRIGERATION SERVICE ENGINEER, Nickerson & Collins Co., Publishers, 435 N. Waller Ave., Chicago, Ill., Published monthly. Vol. 10, No. 3, March, 1942. Entered as second class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Subscription in United States, $2.00 per year; all other countries, $3.00 per year.

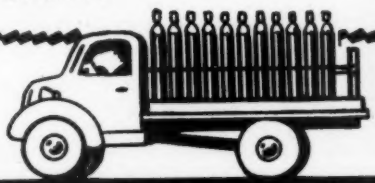
ANSUL METHYL CHLORIDE

KEEP 'EM ROLLING!

Every refrigerant cylinder has a job to do. Don't let empties stand idle in your back room. Ship them back *today!*

ANSUL CHEMICAL COMPANY
MARINETTE **WISCONSIN**

RS-29



KNOW YOUR ANSUL JOBBER?—ASK US FOR HIS NAME

There's a Bright New World Ahead!

Men are fighting . . . planning . . . working the clock around that tomorrow's world may carry a full measure of LIBERTY for all . . . Freedom to progress, to build for a confident future when men may use the works of their hands for the betterment of a long-suffering humanity, wearied from the weight of oppressors' heels.

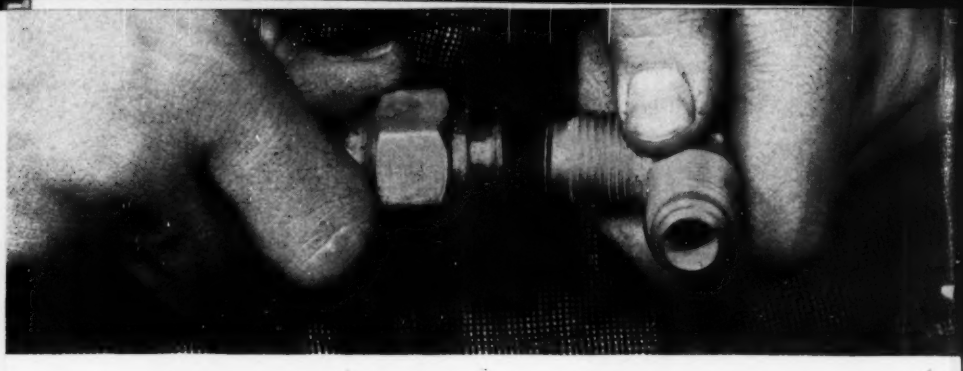
Young America! You SHALL have a bright new world! For the brains and brawn, the skill and knowledge of a Nation of Freemen — fighting heart and soul for RIGHT living — cannot be denied the "Fruits of Victory."

We're glad to do our part — 24 hours a day — that Refrigeration, charged with preserving food for the health and vigor of a fighting nation, may be DEPENDABLY CONTROLLED to essential peak efficiency for the emergency. We, too, have an eye on "Tomorrow" when a peaceful people will benefit by a continuance of research and development in BETTER Refrigeration . . . to help reconstruct a "New World."

AUTOMATIC PRODUCTS COMPANY
2400 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN
Export Dept. 100 Varick St., New York City

. . . and their Jobbers

fp DEPENDABLE Refrigerant Valves

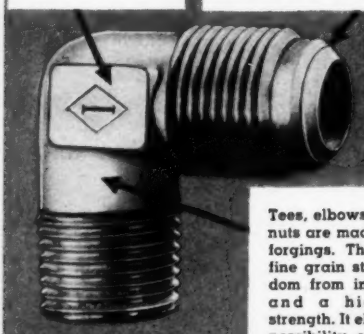


To the best of {YOUR / OUR} ability!

IMPERIAL FITTINGS WILL HELP YOU TURN OUT A BETTER JOB

Flats are placed on elbows and tees. This gives a wrench hold, eliminating the possibility of distorting the body in gripping the fitting, and also speeds up work materially.

The "Triple-Seal" groove is an exclusive feature of all Imperial Refrigeration Flared Fittings. When the flare is drawn up against the groove in the seat the copper is actually extruded into the groove. You get a tight, self-seating joint without danger of twisting the tubing or shearing off the flare. Even when the seat is nicked you can still make a tight joint. You can reconnect as often as you wish.



Tees, elbows, crosses and nuts are made from brass forgings. This assures a fine grain structure, freedom from internal stress and a high tensile strength. It eliminates any possibility of seepage of refrigerant or cracking or splitting.

IN an advertisement of last September you may recall that we pointed out that in 1942 there was going to be a greater need for inspection and servicing of systems than ever before . . . and we wish now that our prediction had not been quite so prophetic.

But war is no respecter of wishes and today, as a result, we all have our jobs cut out for us. You, with rigid limitations on new systems and on parts, will be called upon to keep present equipment in good operating condition. We, with the job of turning out millions of fittings for the machinery of war, will also have the problem of helping you get the fittings, parts and tools needed for your work.

All of us can help maintain the good name of the air conditioning and refrigeration industry if we do the Job to the best of our ability.

THE IMPERIAL BRASS MFG. CO.
1204 W. Harrison St., Chicago, Ill.

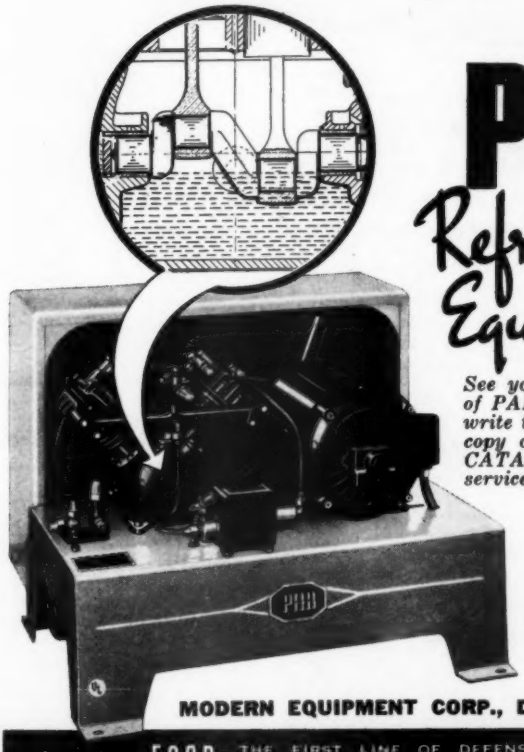
IMPERIAL

Air Conditioning and Refrigeration Products

Drop-Forged Crankshafts In All Par Models!!!

All PAR compressors are equipped with drop-forged steel crankshafts . . . precision machined, case hardened, ground and lapped to a mirror-like bearing surface. Yes, PAR compressors are designed and built with painstaking craftsmanship . . . just like a fine automobile engine.

PAR refrigeration models are engineered as complete units . . . not just a group of sub-assemblies bolted together. That's why, when you install a PAR, you can be secure in the knowledge that you are giving your customers maximum efficiency at minimum operating costs.



PAR

Refrigeration Equipment

See your jobber's display of PAR equipment . . . or write the factory for your copy of the FREE PAR CATALOG—a manual for service engineers!

MODERN EQUIPMENT CORP., DEFIANCE, OHIO

★ ★ FOOD—THE FIRST LINE OF DEFENSE . . . CONSERVE IT WITH REFRIGERATION! ★ ★

THERMO EXPANSION VALVES

Type B—Thermo Valve. ⅛ ton Freon, 1 ton Methyl Chloride.

Type THL—Thermo Valve. 50 tons Freon, 100 tons Methyl Chloride.

Type TG—Thermo Valve. From 1 to 19 tons Ammonia.

Type FR4—Thermo Valve. From 26 to 60 tons Ammonia.

THE COMPLETE ALCO LINE

Covers the Field of Refrigerant Control

● Whatever your requirements in the wide field of refrigerant control, there is an Alco Valve that correctly meets the demands of the job. From the smallest to the largest air conditioning or refrigeration installations, the proper Alco engineered refrigerant control will materially contribute to the efficiency of the system.

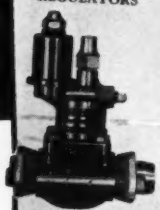
You'll find proof of Alco's leadership in the performance record of thousands of Alco Valves in operation on every type of installation throughout the world today. Alco Valves, plus Alco's engineering experience and extensive knowledge of control problems provide a combination that is second to none in the entire industry.

The complete Alco Line includes Thermostatic Expansion Valves, Automatic Expansion Valves, Magnetic Stop Valves, Evaporator Pressure Regulators, Float Switches and Float Valves — in a wide variety of types, sizes, and capacities.

Alco offers you the most accurate, dependable refrigerant controls available today—designed for long life and completely satisfactory service.

ALCO VALVE COMPANY, 2630 Big Bend Blvd., St. Louis, Missouri

EVAPORATOR PRESSURE REGULATORS

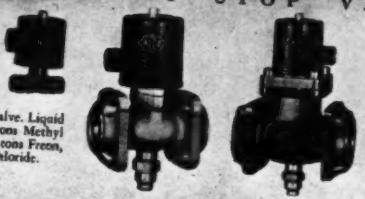


Type EPR — All Refrigerants. Port sizes up to 2 inches.

FLOAT SWITCHES

Type J— Liquid Level Control for All Refrigerants.

MAGNETIC STOP VALVES



Type SI—Magnetic Valve. 3 tons Liquid Freon, 6 tons Liquid Methyl Chloride.

Type R—Magnetic Valve. Liquid —35 tons Freon, 70 tons Methyl Chloride. Suction—9 tons Freon, 18 tons Methyl Chloride.

Type SP—Magnetic Valve. 3 tons Liquid Ammonia.

Type R — Magnetic Valve. Liquid—172 tons Ammonia. Suction—28 tons Ammonia.

ALCO *Engineered Refrigerant Controls*

FOR HIGHEST EVAPORATOR EFFICIENCY

REFRIGERATION is playing an important part in the health and comfort of our Army and Navy. Food must be protected against spoilage.

Chieftain units are installed in many of the Army camps and air fields. Complete kitchens, Chieftain equipped, are found in places as remote as the Canal Zone. Refrigerators and water coolers with Chieftain compressors sail the seven seas with the Navy.

Performance, dependability and availability of replacements are the prime requisites in all of these installations. These are important reasons why Chieftain was selected.

TECUMSEH PRODUCTS CO. TECUMSEH MICHIGAN

Chieftain

THERE'S PLENTY TO DO *in '42*

"FOOD is a whole arsenal of weapons in this struggle for human freedom—food will win the war and write the peace," says Secretary of Agriculture Claude R. Wickard.

—and so, refrigeration has its big part to play in the Victory program, to save food from spoiling; to keep it healthful and palatable, for the men in the services, and for the men, women and children on the vital home front.

You men, in particular, who service commercial refrigeration installations are called upon to do your utmost to "keep 'em running" efficiently day in, day out. And it's not a simple job, with shortages of needed materials and long delays on orders.

In support of your vital job, Penn pledges to do its utmost to supply needed controls and to furnish them with reasonable promptness. Our armed forces naturally have first call on our facilities—but we are determined to serve the needs of the refrigeration industry as fully and as promptly as possible. So . . . remember, you can depend on Penn again in '42 for efficient refrigeration controls.

Penn Electric Switch Co., Goshen, Indiana

Today's Keynote

Hard work, confidence and understanding . . . the keynote for today! *Work* to us means unceasing effort by all to provide every needed essential to the Nation's war effort and to divert every remaining effort toward maintaining our own production because of its essential character in both civilian morale and the subsistence of our armed forces.

But hard work alone is not sufficient. It must be guided by confidence and understanding . . . confidence in our future and understanding of necessary war-time restrictions, and this calls for clear-headed thinking by all . . . the user . . . the distributor . . . the manufacturer. All for the single urgent cause of Victory . . . an emergency we dare not overlook . . . an economic situation that revolves around shortages of skill and materials.

Our suggested keynote for today does not sum up as a hard, fast rule. Each of us has individual problems to counter . . . and each must find a personal solution. But basically, why shouldn't we all apply a general policy of hard work plus confidence and understanding in our daily dealings?

At Kerotest we are united in an effort to lend every possible facility to National Victory . . . we are strong, too, in our belief that the refrigeration and air conditioning industries play an essential part in this nation's concerted action and *deserve* all available assistance that Kerotest can lend.

Kerotest's part must and will be in the form of continuous production on as large a scale as possible . . . and deliveries as promptly as possible under war-time restrictions.

KEROTEST MANUFACTURING COMPANY

PITTSBURGH · PENNSYLVANIA

J. C. Strachan

General Sales Manager

KEROTEST

MANUFACTURERS OF TOP QUALITY VALVES AND FITTINGS FOR THE REFRIGERATION AND AIR CONDITIONING INDUSTRY

Ranco
EXACT
REPLACEMENT CONTROLS
SAVE TIME ON EVERY INSTALLATION–Just Toss Out the Old–Slip in the New!
NO RETURN CALLS TO CHECK SETTINGS
Better Profits!–Satisfied Customers!
NO ADJUSTMENTS OF ANY KIND!
Ranco
INC.
COLUMBUS
OHIO

The Refrigeration Service Engineer

Vol. 10 No. 3

March, 1942

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

Official Organ
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MANPOWER AND MATERIALS
KEYS TO NATIONAL DEFENSE
-they must be conserved

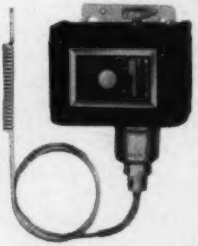
Defense requirements must come first. Demands are heavy—will be heavier—and they must be met. Hence, it is a patriotic duty to conserve manpower and materials—the twin keys to National Defense.

In laying out refrigeration and air conditioning installations, it is necessary to consider these factors. As the army grows—capable service men will be fewer—the answer is equipment that requires minimum service. If equipment is ineffective and has to be replaced, added and unnecessary loads are thrown on production machines needed for turning out military supplies. Additional materials must be used which may be needed elsewhere. Select equipment that won't have to be replaced.

Detroit Refrigeration Valves and Controls have proved their dependability, effectiveness and durability. They make the least possible demands in service and replacements.

No. 673
Thermostatic
Expansion Valve

No. 682-3
Solenoid Valve



No. 450 ZL-1
Temperature Control

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

The Refrigeration Service Engineer

Vol. 10, No. 3 CHICAGO, MARCH, 1942 $2.00 Per Annum

On the REFRIGERATION Front

Current News Briefs—March 9

SPECIAL—A-10 Priority Extended to Retail Stores

. . . — Washington, March 9. Use of the A-10 rating under the P-100 order for the repair and maintenance of refrigerating equipment in **retail stores** was granted under a WPB amendment issued today. Formerly this order excluded retail outlets, but the present ruling gives relief to the service man in securing repair parts for retail establishments.

Repair Order

. . . — The long awaited repair order still awaits official release. Its status as reported several months ago remains unchanged. Several predictions have been made as to a release date, but at the present well informed sources refuse to "stick their neck out further" to hazard a guess as to when it may be issued. Soon, we hope.

Service Men to Be Licensed

. . . — It seems a certainty that the repair order now being formulated will provide for the licensing of all refrigeration service men. Details as of this date are lacking. It is expected that such licensing will provide the WPB with a "big stick" to supervise the operation of the order.

High Priority Rating

. . . — The necessity for control is that the repair order is expected to carry a high preferential rating so that delays will be eliminated in securing the necessary parts for replacement and repair of existing equipment. The licensed service man will use his license number to endorse orders to his jobber. Abuses of the provisions of the order will mean the loss of license —out of business will be the result.

Abuse of Priority Rating

. . . — We can't point out too strongly that misuse of priority ratings carries a severe penalty. Recent action of the WPB in denying the further use of preferential ratings by large manufacturers who violated their provisions indicates increased watchfulness. At present the only refrigeration repair order available is P-100, carrying a preference rating of A-10, originally applicable **only** to refrigeration installations in **wholesale** plants but extended in an amendment of March 9 to **cover retail stores.** (See first item on this page.)

J. M. Fernald Appointed to Refrigeration Section of WPB

. . . — J. M. Fernald, formerly General Manager of Baker Ice Machine Company, Omaha, is the new head of the refrigeration section of WPB. The refrigeration section now included in the Durable Goods Branch of WPB will function shortly as a new and distinct section of the Division of Industry operations of WPB. Mr. Fernald's association in the refrigeration industry is of long standing and he is thoroughly familiar with the industry's requirements.

Refrigeration Rumors

. . . — The story is told about the Washington reporters who wanted to test how fast rumor travels. Purposely they circulated a rumor about two miles from the Capitol and then took a cab to the Capitol to time its arrival. It had arrived before them. Last week the refrigeration industry had just such a rumor which caused some uneasy moments and made its rounds from coast to coast in one day. Don't believe rumors until verified by authoritative sources and then it might be well to recheck.

Shortage of Service Men Felt

. . . — Military service has been responsible for the loss of some men in the service business. Others have found more lucrative jobs in defense work. Still others finding that the situation is serious in respect to securing repair parts and impatient to wait for the repair order, have left the industry for other vocations. The situation may have its full effect this summer when service and maintenance reaches its peak. It is anticipated that the service men in the industry can look forward to long hours.

Tire Rationing

. . . — Not only is the situation becoming more serious daily in respect to securing parts, but another critical condition exists in the matter of tire rationing. The Refrigeration Service Engineers Society, in behalf of all the service industry, has made personal representations to Washington to secure relief as a "vital and essential" industry. Provision is made for the securing of tires for service **trucks** under the eligibility classification of essential civilian service, however, no provision has been made for the great majority of business cars used for service work. Appeals have been made for relief for securing new tires, retreads and recaps. Formal representation has been made to the Office of Price Administration. Fortunately in some locations, due recognition has been made by the local tire rationing board of the essential service the refrigeration men perform and their requests have been handled accordingly.

As this issue goes to press the letter reproduced from the Assistant General Counsel of the Office of Price Administration contains an important "ray of hope" under Section 504(a). (2). "Transportation of persons to enable them to render construction or mechanical, structural or highway maintenance and **repair service.**

Copper

. . . — Copper is tightening up and while still available for essential civilian requirements under order M-9-C its use is being restricted in new supplementary orders by WPB. At the present time, a jobber is prohibited from supplying copper unless the order bears an A-10 priority rating or higher. Under the present reg-

Tire Relief for Refrigeration Service Cars?

OFFICE OF PRICE ADMINISTRATION
WASHINGTON, D. C.

March 5, 1942

Refer to: 5:12:HE

Refrigeration Service Engineers Society

433 North Waller Avenue

Chicago, Illinois

Gentlemen:

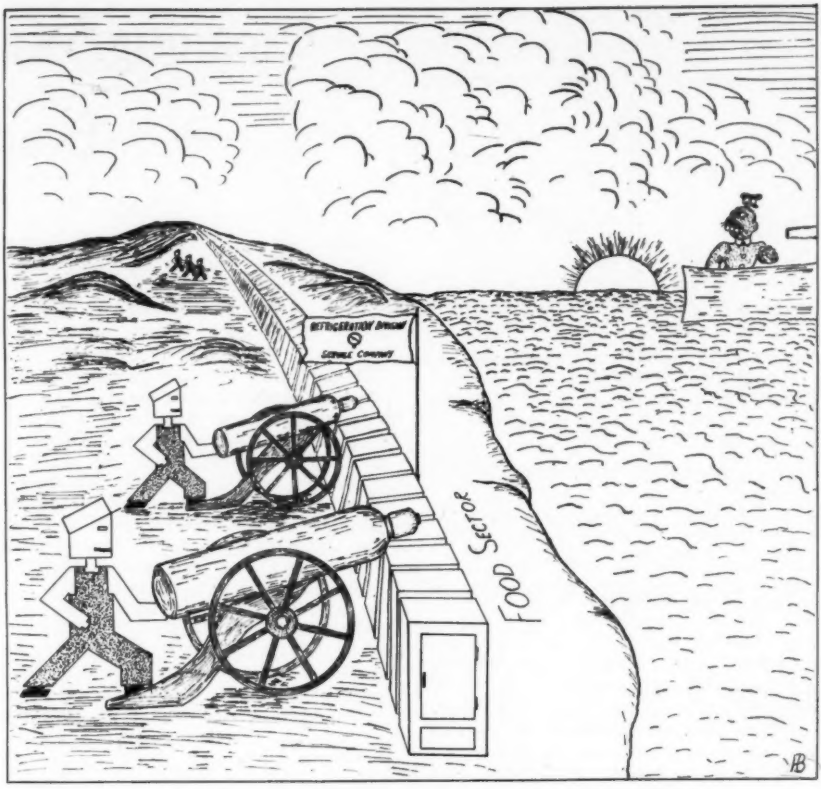
We have your letter of February 24 in which you inquire concerning the eligibility status of passenger cars used by refrigeration service men for repair and maintenance of refrigeration equipment.

Section 504 (a) (2) of the Revised Tire Rationing Regulations provides for the eligibility for recapped tires of passenger cars used principally to provide transportation of persons to enable them to render mechanical maintenance and repair services. Certificates may be issued under this paragraph only to provide transportation between jobs. In the event that any of your service men feels that he is entitled to a certificate under this section of the Regulations, the correct procedure for him to follow is to apply to the Local Rationing Board of the area where the vehicle is garaged or normally stationed. On such application opportunity will be afforded for a complete presentation of all of the circumstances upon which the applicant's right to a certificate depends, including not merely the fact that the vehicle may be within one of the eligibility classifications established by the Regulations, but also local conditions and questions which can be decided most appropriately by the Local Board.

We feel that the procedure suggested will afford you a far more effective opportunity for a full presentation of your case than would an attempt for this office to render a decision upon a necessarily brief and possibly incomplete outline of your problem presented through correspondence.

We enclose a copy of the Revised Tire Rationing Regulations for your convenience.

Sincerely yours,
(Signed) Thomas E. Harris
Thomas E. Harris
Assistant General Counsel



HOLD THAT LINE! REFRIGERATION WILL HELP WIN THE WAR.

ulations copper is not available for servicing retail users or domestic jobs. Some relief may be afforded to the refrigeration field for the use of copper for repairs and replacements in the new repair order.

New Refrigerators "Frozen"

. . . — The War Production Board ordered the production of domestic mechanical refrigerators to be discontinued after April 30, 1942, so that the entire industry can be converted into the production of war materials.

Limited production is permitted until the cut-off date. The order L-5-c supersedes a previous order, L-5-a, which governed the rate of refrigerator production for the months of January and February. L-5-c permits manufacturers to produce between February 15 and April 30 a number of refrigerators equal to three times the number permitted for February by the superseded order. Thus, a manufacturer who was permitted under L-5-a to build 100 refrigerators in February is permitted under the new order to build 300 refrigerators between February 15 and April 30, regardless of the number of refrigerators produced by him during the first half of February under the superseded order.

Refrigerators produced up to April 30 will be frozen and will aid in the building of a stockpile that will total approximately 750,000 units, which will be available only for essential civilian and military requirements.

The order does not affect the production of replacement parts, which will continue unrestricted.

Prices "Pegged"

. . . — Existing prices for mechanical household refrigerators are established as the maximums that may be charged by manufacturers in a new price schedule issued by Leon Henderson, Administrator of the Office of Price Administration.

(Continued on page 48)

Cleaning Water Co
Evaporativ

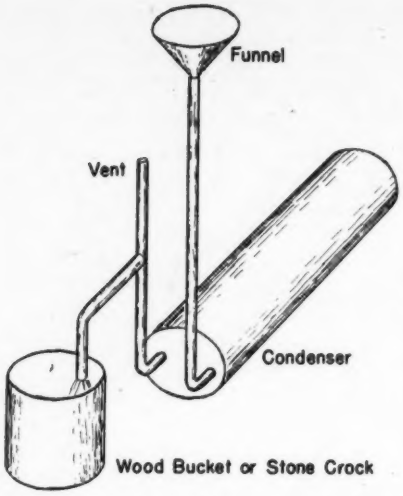


Fig. 1—The gravity flow method of cleaning shell and tube or counterflow condensers with acid solution.

By KENNETH SHEA

WHILE water contains many different impurities there are only two, iron and lime, with which we need be much concerned. These two form a hard scale on the walls of the water tubes or evaporating surfaces which acts as an insulator to the passage of heat or may stop the flow of water.

The method of cleaning depends on the characteristics of the scale deposit and on the construction of the condenser. Some scales are harder than others and must be removed with acids. Others may be removed with wire brushes if the construction permits.

If the condenser is of the shell and tube type with a removable head, the scale in the tubes can be removed with steel brushes attached to long handles. There are several different types of tube cleaners on the market for this purpose and it is probable a local hardware store or plumbing supply store will have them.

Two sources of supply for such brushes are: The Chicago Engineering Supply Company, 116 West Illinois Street, Chicago, Illinois, and W. B. Pierce Company, 50 North Division Street, Buffalo, New York.

Be sure that the brush you select is of a type that will not injure the water tubes.

The simplest method of cleaning condensers, although perhaps not the quickest, is with an inhibited acid solution. All types can be cleaned with this method.

Formula

The solution for acid cleaning can be made up in the following proportions:

78 parts by volume of water
22 parts by volume of commercial hydrochloric (muriatic) acid Sp. Gr. 1.19
1.7 lbs. per 100 gals. of solution or .27 oz. per gal. of solution, inhibitor powder (Grasselli No. 3)

The proportions given in this formula should be maintained as closely as possible with not more than a 5% variation.

Grasselli No. 3, the inhibitor powder, may be purchased from the Grasselli Chemical Division of E. I. DuPont de Nemours & Company, Cleveland, Ohio, or any branch office.

When mixing the solution, place the estimated amount of water required in a wood or stone container, then add the necessary amount of inhibitor while stirring. Continue stirring until all the powder is dissolved and then add the required amount of acid.

Inhibited acids should be handled with the same precautions as any other acid, particularly during the process of mixing. Inhibited

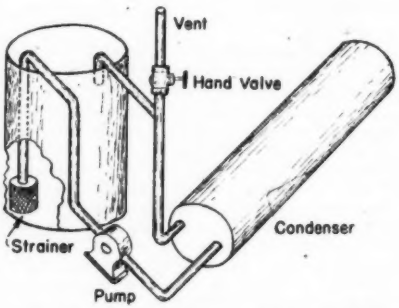


Fig. 2—The forced circulation method of cleaning shell and tube or counterflow condensers.

ter Cooled or

por ative Condensers

acid will stain the hands and clothing and will attack concrete. Before the inhibitor is added it will also attack steel. Every precaution, then, should be used to prevent splashing and spilling. Surfaces that are in danger of being splashed should be covered with boards or burlap. Do not permit the inhibited acid to come in contact with galvanized surfaces because the galvanizing will be removed by the acid.

During the process of cleaning, gas will be generated by the action of the acid on the scale. This gas is not harmful but where the gas is escaping through a vent pipe every precaution should be taken to prevent acid from spraying out with it.

Gravity Flow Method

Two methods of circulating the acid through shell and tube or double tube counterflow condensers can be used, depending on the construction of the condenser and its condition. If the scale formation is not too thick the gravity flow method with a setup such as illustrated in Fig. 1 can be used. It is not necessary to remove the condenser from the machine but the water connections must be removed and connections made similar to Fig. 1. The vent pipe should always be connected to the highest condenser connection.

This method of cleaning shell and tube or counterflow condensers is not particularly new since similar methods have been suggested before. However, the formula given is most interesting and the method of cleaning evaporative condensers most helpful. Of particular interest is the water treatment recommended for evaporative condensers which in most cases will prevent any further formation of scale.—Editor.

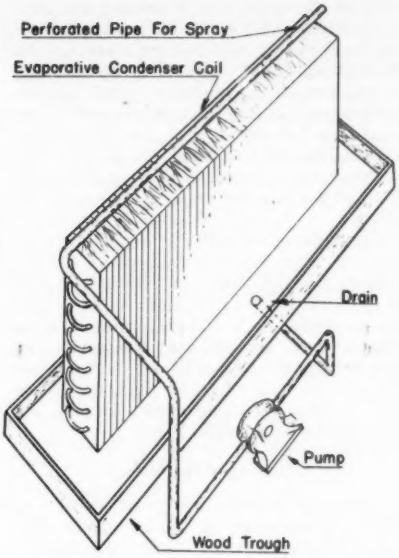


Fig. 3—Cleaning Evaporative condenser coils which are too large for submerging in a bath of cleaning solution.

Introduce the acid by pouring it into the funnel very slowly at first. The solution must not be added faster than the vent can exhaust the gases which are generated during the cleaning. When the condenser is full, allow the solution to stand in it over night.

Forced Circulation

If the scale formation is very heavy forced circulation of the acid should be used in order to speed up the work and to assure the passage of acid through the coil. A setup similar to that shown in Fig. 2 can be used and here again it is unnecessary to remove the condenser from the machine. The container shown in Fig. 2 can be a small steel oil container or wooden keg of 10 or 15 gal. capacity but do not use galvanized containers. The strainer can be made of ordinary brass or copper window screen since its only purpose is to keep the larger pieces of loose scale from entering the pump. The pump should be a centrifugal pump of about 30 g.p.m. capacity and will probably require a ¼ horsepower motor to drive it. The pipe connections can be one-inch steel pipe or any size copper tube found necessary for connection to the condenser.

As in the gravity flow method the vent must be connected to the highest level opening to the condenser and as shown in the illustration, a globe valve must be installed in the vent. The vent valve should be open while the solution is being introduced to the condenser but closed after the condenser is full and the solution being circulated. Filling the condenser should be done slowly, allowing time for the gases generated to escape.

The solution should be circulated over night for the average deposit but for extremely heavy deposits the time will have to be increased up to as long as 24 hours. Faster action can be obtained when the solution is warm and running the condensing unit for short periods will add the necessary heat to the solution. The cleaning will be just as thorough with a cold solution but will require more time.

Flushing with Water

After the solution has been allowed to stand or circulate in the condenser long enough to remove the scale, the solution should be drained out and the condenser thoroughly flushed with water. Shell and tube condensers with removable heads must be exceptionally well flushed because of the tendency of the acid to pocket in these condensers.

Evaporative Condensers

Evaporative condensers are more susceptible to lime and scale because there is more tendency toward concentration of solids in the water. During the normal operation of the condenser, fresh water is added automatically as needed and is evaporated into the air as it is sprayed over the condenser coil. This evaporating process can be compared to a distilling process where the impurities and solid matters are distilled out and remain in the sump of the condenser.

In the evaporative condenser, the concentration of lime, scale and other impurities tends to increase as additional water is added. For this reason it is advisable to allow a certain amount of overflow in the sump of the condenser to carry away the accumulation of slime.

Small evaporative condenser coils can be cleaned of scale by removing the coil and submerging it in a bath of the inhibited acid. In most cases, however, the coil is too large for this method and would require too large a tank and too many gallons of solution to be practical.

The forced circulation method of cleaning will be found most suitable for the average cleaning job. The setup will be as shown in Fig. 8, using the same pump as previously mentioned and permitting the acid to spray down over the coil from a length of perforated pipe. The trough shown can be constructed from tongue and groove fir flooring and painted on the inside with one of the acid resisting paints found on the market. For occasional use it may be used without painting but should be soaked with water long enough to seal the joints and make it water-tight.

If the evaporative condenser is such that a temporary drain pan of wood or metal can be built and placed under the coil while cleaning, it is possible to do this job without removing the coil from the housing. Most evaporative condenser panels and drain pans are galvanized iron and because the inhibited acid will remove the galvanizing, a temporary drain pan must be used and the side panels protected from the acid. When using a temporary drain pan under the coil, block the float open in the sump of the condenser and allow a good overflow of water throughout the cleaning period to wash away any acid that may be spilled.

Preventing Further Lime Formation

After the evaporative condenser has been cleaned and flushed with water it is desirable to prevent if possible any further accumulation of lime through the treatment of the make up water. Calgon, Inc., 800 Ross Street, Pittsburgh, Pennsylvania, have developed a material known as Micromet for this purpose and will be found suitable for average types of scale forming waters. The material is a slowly soluble phosphate glass which can be placed directly in the sump of the evaporative condenser or the incoming water line. It requires no special means of putting into solution. It dissolves at the approximate rate of 25% per month and therefore requires only a monthly inspection for possible renewal.

Micromet will not remove the scale already formed on the condenser, thus the need of starting with a clean condenser. The amount of Micromet used is about ½ lb. per ton condenser capacity with about 25% replacement per month. On this basis the replacement rate will be about ⅛ lb. per ton per month.

It is advisable to clean out the sump of the evaporative condenser periodically to get rid of the sludge that accumulates and it is therefore convenient to place the Micromet

in a basket of fine mesh wire. This basket also serves as a convenient means of replenishing the material because the renewal rate may vary from month to month, depending on the amount of use the condenser receives, and the level of the material in the basket provides a quick method of determining the amount of replacement required.

Place the basket of Micromet in the sump where it will be in direct contact with the recirculating water. It is important that a definite rate of overflow be maintained even when using Micromet because without it there will be a gradual increase in the concentration of lime in the recirculated water which will cause a decrease in the effectiveness of the Micromet. Without overflow scale will again form on the coil.

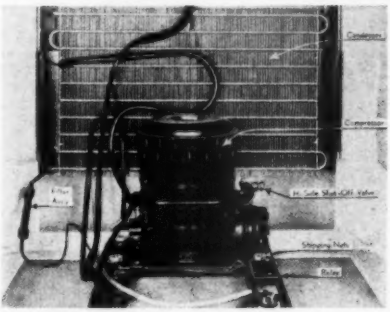


Fig. 3—The AHF-89 Gibson unit which was manufactured in 1939. The compressor of this unit is nearly identical with units used in 1940 and 1941.

Service Data on The Gibson Refrigerator

(Continued from February)

Including the essential service data on all Gibson units and detailed service information on current models.

Charging Instructions

AFTER oil has been added—when necessary—and replacement or repair has been made, make all necessary connections preparatory to charging and proceed as follows:

1. Remove cap at "tee fitting" on suction side of compressor and connect a length of ¼" copper tubing from the tee-fitting to a 5-lb. charging drum.
2. Disconnect hi-side line at "Y" fitting and plug with 5/16" flare plug.
3. Run the unit until entire system is on a 25" vacuum or until no pressure can be detected when finger is held at opening on "Y" fitting. (A compound gauge 30" vacuum to 150 pounds pressure can be installed with the use of a tee-fitting at the charging drum to accurately check vacuum.)
4. Stop compressor.
5. With charging drum upright (valve at top) open valve on drum to permit Freon gas to flow into the system.
6. When gas starts to escape through "Y" fitting, close valve on charging drum and allow one minute for Freon gas to flow through the capillary tube into the condenser.
7. Remove plug from hi-side line and connect to "Y" fitting.
8. With drum inverted (valve at bottom) open drum valve and charge with liquid Freon for 1¼ minutes in a 90° room, 1 minute 25 seconds in a 70° room and 1 minute 10 seconds in a 110° room temperature. Approximately 10 oz. of Freon will enter the system with the above timing.
9. Close drum valve, start unit and allow to cycle on No. 1 position, then check for amount of charge. A properly charged system will frost through the evaporator on the running cycle and hold a solid frost on the evaporator boiler on the off cycle without frosting out on the suction line at the back of the cabinet. Frosting out of the back of the cabinet is an indication of overcharge. The evaporator boiler defrosting on the off cycle is an indication of undercharge. (Allow for some defrost on the off cycle in room temperature below 70°.)
10. Disconnect ¼" copper charging line at tee-fitting on motor compressor assembly, replace and tighten cap (while removing tubing and replacing cap a

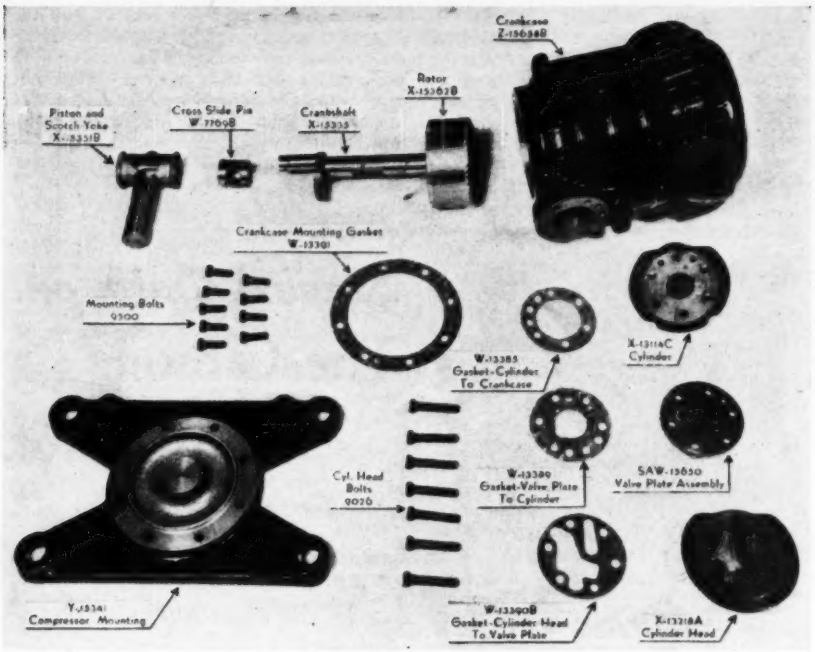


Fig. 4—Compressor parts of the AHF-89 and AHF-80 units which were manufactured in 1939 and 1940.

small amount of Freon gas will escape.) With the pressure at 30 pounds or less only a very small amount of gas can escape through the small opening in the tee connection, thus making the amount negligible when the change is made in a reasonable length of time. A restrictor in the tee-fitting makes this possible.

Adding Oil

All service replacement motor compressor assemblies are charged with the proper amount of oil at the factory. It is unnecessary to add to or drain oil from these compressors except when the evaporator or condenser has been washed and dehydrated in which case add approximately 4 oz. oil. This amount with the 16 ozs. already in the replacement compressor assembly is equal to the original oil charge—20 oz. No. 3 Sunisco refrigerator oil.

If a refrigerator has been in operation for any length of time; after a tube has been broken or cracked; or after a leak occurs at the soldered connection, a certain amount of oil may be lost with the escaping Freon gas. Thus, oil must be replaced unless a compressor exchange is made, before recharging the system.

The approximate amount to be added can usually be determined by estimating the quantity of oil observed around the base of the cabinet, in most cases 3 to 6 ozs.

Oil is most easily added when the system is discharged as follows:

Remove suction line from "tee-fitting" at compressor; connect a short length of 5/16" tubing to the "tee-fitting" and insert other end into a container with the proper amount of oil to be added. Run unit to draw oil from the container into the compressor assembly.

Moisture in System

This condition has the same symptoms as a plugged or restricted filter.

To determine the difference, shut off the unit and allow the evaporator to warm up. After the unit is again started, the evapora-

tor will frost for a short period of time, then defrost. This is caused by moisture in the system freezing at the outlet of the capillary tube (where it is soldered to the evaporator) and stopping the flow of refrigerant.

If there is only a small amount of moisture in the system, the addition of 8 cc. (approximately two teaspoonfuls) of high grade wood alcohol, commonly called Methyl Alcohol or Methanol, will remedy the trouble. When adding Methanol, it is very important that it be injected into the system properly to get the desired results.

Adding Alcohol

Do not add alcohol to a system equipped with either a Silica Gel dryer, or an aluminum evaporator.

If a moisture condition exists in a system equipped with a Silica Gel dryer, the entire system should be discharged, a new Silica Gel dryer installed and the system recharged. This dryer is connected into the outlet tube at the bottom of the condenser replacing the filter assembly used on other models. The dryer can easly be identified by its size. Approximately 2½" long and diameter 1¼"—it is shorter and has a larger diameter than the filter which is approximately 3¼" long and ½" in diameter.

To a system not equipped as above, approximately two teaspoonfuls of high grade wood alcohol (pure and dry), commonly called Methanol or Methyl Alcohol, must be added, after discharging and recharging. The most convenient method is to have a mixture of Methyl Alcolohl and Freon in your charging drum. Simply add ½ oz. of Methyl Alcohol for every pound of Freon, to your charging drum.

To add alcohol to a system already charged with Freon, the use of a line shut-off valve with a short length of ¼" copper tubing connected to the "Y" fitting from one side and a 16" length of ¼" copper tubing filled with alcohol, connected to the charging drum from the other side of the line shut-off valve, is the most satisfactory.

Stop unit and allow pressure in system to equalize before removing ¼" cap at "Y" fitting. Pressure at that time normally will be 30 lbs. or less. Thus, the connection can be made with a negligible loss of refrigerant. With one end of the short length of copper tubing (approximately 6") connected to the line valve—remove cap and connect the other end to "Y" fitting—fill a 16" length of ¼" tubing with Methyl Alcohol and connect from other side of line valve to valve on charging drum. With drum upright (valve at top) open drum and line valves and drive into the system with gas pressure only. (The length of time required to drive the alcohol into the system is only a matter of seconds—10 to 20 seconds.) Always make sure that pressure in charging drum is higher than that in system.

Run unit for two or three minutes to circulate the alcohol through the system.

Stop unit and allow three minutes for pressure to equalize before removing line at "Y" fitting. At that time the pressure will normally be close to 30 lbs. or less. Thus, while the line is being removed, a negligible amount of Freon will escape.

It is always advisable, if possible, to operat the refrigerator with the control set at defrost position for approximately three or four hours immediately after adding alcohol so that the alcohol may circulate thoroughly and absorb any moisture in the system.

A very small amount of free moisture in the system may cause a customer to report that her refrigerator quits freezing and defrosts once a week or possibly more often than that—but all of a sudden it starts working all right again.

This is caused by the free moisture freezing at the outlet end of the capillary tube when it enters the evaporator; plugging the line and preventing refrigeration.

Adding Refrigerants

1. Stop unit and allow two or three minutes for the pressure on the Low-side to build up above atmospheric pressure (0 lbs. gauge pressure) to prevent any possibility of air entering the system when cap is removed.

2. Remove cap on Tee-Fitting and connect convenient length of ¼" copper tubing from Tee-Fitting to five-pound charging drum.

3. Open valve on charging drum. Allow a small amount of Freon to enter the system then the close the valve, start unit and check charge.

Determining Correct Charge in System

A properly charged system will frost through the evaporator on the running cycle and hold a solid frost on the evaporator boiler on the off cycle without frosting out on the suction line at the back of the cabinet. Frosting out the back of the cabinet

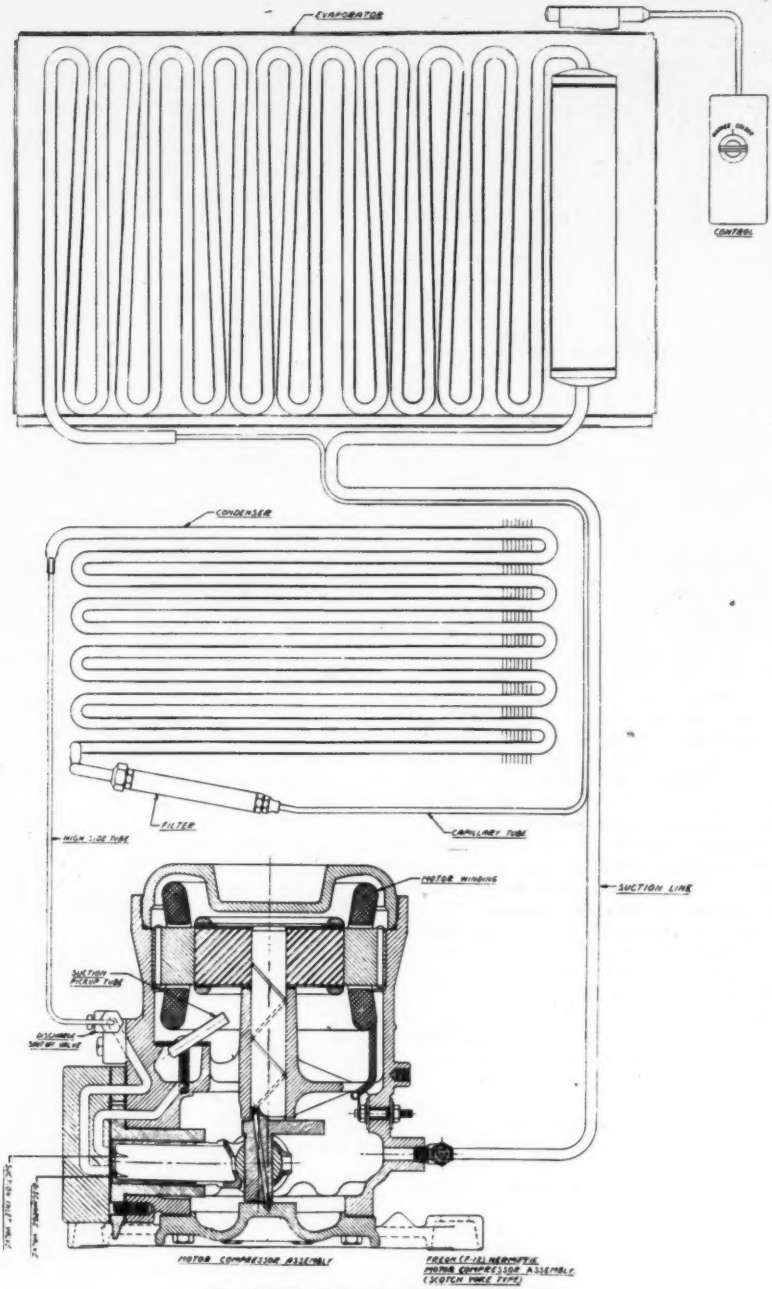


Fig. 5—Cycle of operation of the AHF-80 unit.

is an indication of overcharge. The evaporator boiler defrosting on the off cycle is an indication of undercharge. (Allow for some defrost on the off cycle in room temperature of 70° or lower.)

An overcharge also will be indicated by the Hi-side gauge pressure being higher than normal while an undercharge will be indicated by the Hi-side gauge being lower than normal. (See Operating Pressure, Table 2 in the February issue.)

Air in System

The presence of air in the system can usually be traced to an improperly evacuated system before charging although a leak in the Low-side will cause an undercharged condition resulting in a drop in back pressure to below 0 lbs. and allowing the air to be drawn into the system.

Symptoms of the above condition are higher than normal condensing or Hi-side operating pressures and a frost back on the suction line at the back of the cabinet such as appears when the system is overcharged.

An abnormal amount of air in the system may cause the automatic relay to start and stop the motor.

To purge air from the system: Stop unit. Loosen cap on "Y" fitting and allow gas to escape slowly for a few seconds. Tighten cap—start unit and run for a short time, then repeat operation until condition is corrected.

Installing Replacement Motor

If for any reason it has been found necessary to change the motor compressor assembly, the following procedure should be used:

1. Stop unit and loosen flare nut or cap at Hi-side "Y" fitting and purge Freon slowly in gaseous form only. (Care must be taken that Freon does not discharge too quickly and allow ice to form around the fitting as it may result in getting moisture into the system.)
2. With the system discharged, disconnect discharge line at "Y" fitting and suction line at "tee" fitting.
3. Remove wires from the three terminals located just above the "tee" fitting.
4. At this point, the entire assembly can be lifted out of the cabinet.
5. Remove "tee" fitting and "Y" fitting from old compressor assembly and install on new replacement motor compressor assembly, using permatex or its equivalent on the ⅛" pipe threads. This should be put on the threads only, and should not be permitted to get into the system.
6. Place assembly on mounting springs—connect wires to terminals and suction line to "tee" fitting, then charge.

CAUTION: After removing compressor assembly careful inspection should be made for any signs of burned insulation or carbonized oil caused by excessive heat or shorted motor. If any such signs are noticeable the filter should be removed, inspected and replaced if dirty.

Changing Throttle Tube or Evaporator

The throttle or capillary tube, is soldered into the evaporator assembly with silver solder and may be replaced separately if so desired. However, it is recommended that the entire evaporator be replaced with a new evaporator assembly, complete with connecting tubes, dehydrated and sealed at the factory.

The evaporator assembly can be removed very easily. After removing control loosen the nuts on the evaporator hangar bolts, which support the evaporator in the food compartment; disconnect flare connections, one at filter, and one at the compressor; straighten tubing out at the back of the cabinet. Then lift evaporator off hangar bolts and pull straight out through the front.

Install new evaporator assembly in same position as the one removed; make flare connections, same as before, using great care in bending tubing so that it is not kinked.

Changing Valve Plate Assemblies

1. Discharge system as per instructions.
2. Remove the cap screws holding the cylinder head, valve plate and cylinder in place.
3. Remove the cylinder head and valve plate assembly, using care that the cylinder itself is not removed. If cylinder is loosened, replace gasket between cylinder and housing with a new Neoprene gasket dipped in oil. Replace cylinder with flat side of cylinder up.
4. Place the new valve plate assembly in position, using a new Neoprene valve plate gasket, dipped in oil and making sure that suction and discharge valve

leafs are soldered securely in correct position on valve plate.

5. Using a new Neoprene head gasket, dipped in oil, replace the head with flat side up. Insert cap screws and tighten diagonally.

If it is found necessary to solder a valve leaf to the plate, extreme care should be used in locating leaf properly on valve seat. A soldering iron should be used and solder joint filed down even with valve leaf. Do not use any more solder than is absolutely necessary to hold leaf on plate.

6. Pump air out of system and recharge.

(Concluded)

Service Information on the Stewart-Warner Refrigerator

(Continued from the February issue)

Servicing Fans

THREE makes of fans are used in the 1940 sealed unit refrigerators: Delco, Russell and General Electric. The Delco and General Electric fans have the manufacturer's name on the motor body. The Russell fan carries no name, but it has a three-bladed fan.

These fans are connected into the refrigerator circuit differently and also have different internal connections. Since several types of relays and fans are being used, there are a number of different wiring combinations (see Figs. 3 and 4).

If you are installing a fan of a different make than the one being removed, you must change the wiring for the make of relay and fan being used.

All three types of fans will run for years without oiling, although provisions have been made for oiling when necessary. The General Electric fan motor has a small rubber plug at the top of the motor housing at the rear bearing (the bearing away from the fan blades), which should be pried out to uncover the oil hole. The Delco motor has a small knock-out above the rear bearing which should be punched through to add oil. The Russell fan has a screw at the top of the front bearing which may be removed for oiling.

A light weight motor oil (S.A.E. 10 or 10W) should be used for best lubrication. The very thin household oils in general use do not have enough body for motor use.

Delco Fan Motor: The Delco fan motor is self-starting and will run even if the compressor motor does not. One winding of the fan motor (red and white leads) is connected across the 110-volt circuit, and the other winding (black and white leads) is connected in series with the sealed unit motor.

The series winding is provided to give added starting torque even though the fan will run if only the parallel winding is connected to the power line. Since the sealed unit motor gets its power through the series winding of the Delco fan motor, the sealed unit will not run if this winding is open-circuited even though the fan will operate.

The Delco fan can be tested by connecting 110 volts 50 to 60 cycle A.C. to the red and white wires. If it runs with these connections, also try connecting the power to the red and black wires. If it still runs it is operating properly.

Never connect 110 volts across the black and white wires, since this will burn out the series winding or blow a fuse.

General Electric and Russell Fan Motors: Both General Electric and Russell 50-60 cycle fan motors are of the two-wire self-starting type. The General Electric 25 cycle motor has three wires and is not self-starting, so that it will run only when the compressor motor runs.

Replacing a D.P.C. Valve

Symptoms of Defective D.P.C. Valves: A D.P.C. valve may need replacement because it is noisy, leaky, or stuck. A properly functioning D.P.C. valve should emit a slight buzz or hiss which may be heard when the door is open.

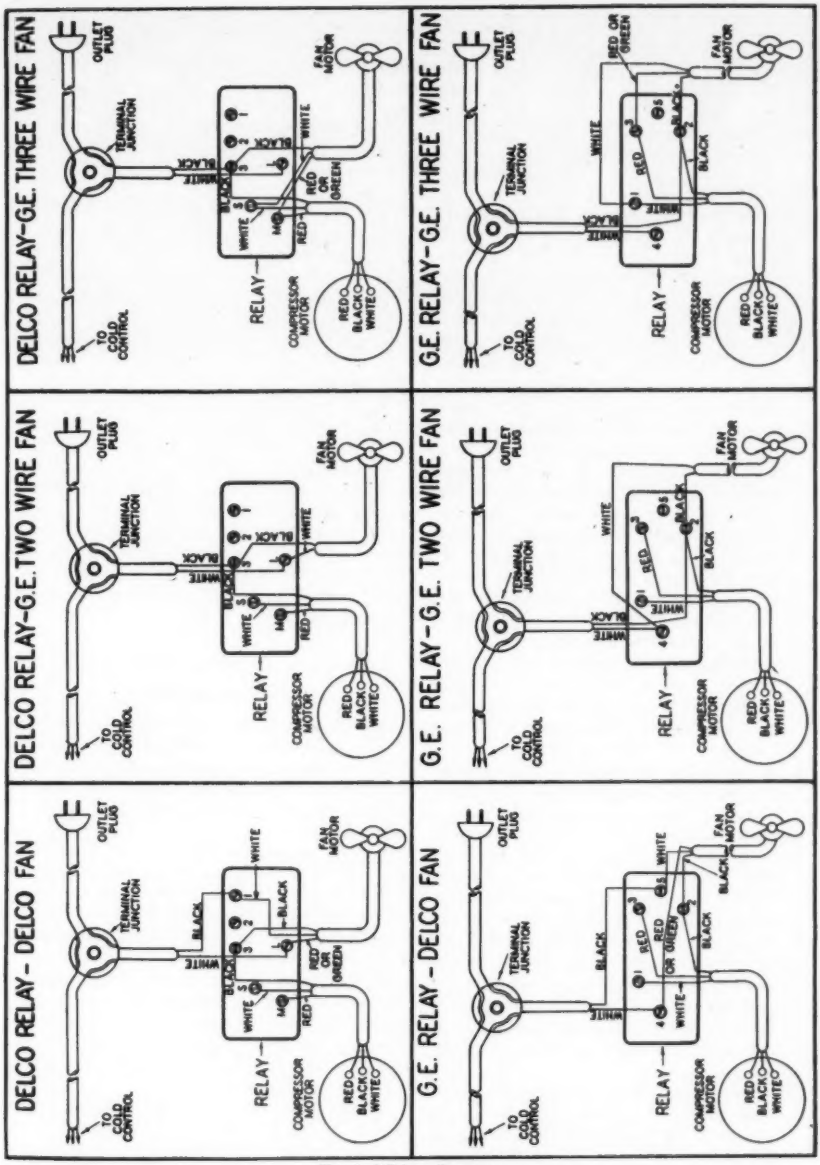


Fig. 3—Wiring diagrams.

A D.P.C. valve that is stuck shut will develop the same symptoms as one that is frozen shut due to moisture. Before you replace a D.P.C. valve that appears to be stuck closed, check for moisture in the system.

A leaky D.P.C. valve would show all three of the following symptoms. If only one or two of the three symptoms listed are ob-

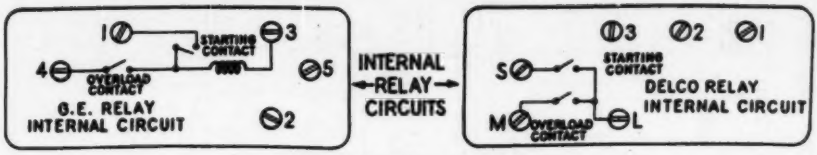


Fig.4—Relay Wiring diagram.

tained, the trouble probably lies elsewhere.

1. *Freezing Locker Temperature Too High:* The D.P.C. valve is used to provide the low temperatures for the Dual-Temp Freezing Locker since it is set to maintain a pressure differential of about 15 to 20 lbs. between the evaporator plate and the Freezing Locker coils. In this respect it acts somewhat like an expansion valve. If the valve is leaky, the pressure difference is less than normal, which means that the temperature difference is also less than normal. Since the cold control is in the upper food compartment, only the lower compartment temperature can change. As a result, the greater the leak, the higher the temperature in the frozen food compartment, up to the point where it equals the temperature in the upper food compartment.

   Shortage of refrigerant will also result in a warm frozen food compartment, but it will not be accompanied by symptom No. 2 described in the following.

2. *Equalization of High and Low Side Pressure During Off-Cycle:* If a set of gauges is installed on a normal refrigerator it will be seen that immediately after the unit stops running the high side pressure will start dropping and the low side pressure start rising until usually there will be a difference of about 15 to 20 lbs. between the two. A difference of more than 20 lbs. in the two gauge readings does not necessarily indicate anything abnormal but *if the D.P.C. valve is leaky, the two pressures will usually equalize by leaking through the valve.*

   Since a leak in the compressor piston and discharge valves will also cause pressures to equalize, this symptom is not final proof of a leaky D.P.C. valve unless it is accompanied by symptom No. 1. A slug of oil may prevent equalization of the pressures even if the D.P.C. valve is leaky so it is desirable to check for one more condition. Read the low side pressure when the unit cuts out and again when it cuts in. If the difference between these two readings is more than 15 lbs. the D.P.C. valve may be leaky. Of course this may also be due to the cold control having too great a differential so if there is any doubt, the cold control setting should be checked.

3. *Long Off-Cycle, Short On-Cycle:* This symptom may not be very prominent if the leak in the D.P.C. valve is a small one.

Replacement D.P.C. valves come thoroughly dehydrated and sealed with brass caps, which must not be removed until just before the valve is to be installed. Under no circumstances should you take the valve apart, since this would disturb its accurate adjustment.

Moisture Dripping from Top of Evaporator Plate

Evaporator plates in early production Model 660 and 860 Dual-Temps were finished with a high gloss baked Dulux enamel. Glossy surfaces, however, are generally slightly water repellent particularly if they are not perfectly clean and free from all traces of grease and oil. The moisture that condenses on an evaporator plate with a glossy finish may tend to collect in large drops instead of running down the plate. Any slight jarring of the refrigerator may cause these drops of water to fall.

To overcome this condition, later production Dual-Temp refrigerators used a flat finish for the evaporator plate. This finish permits the tiny droplets of water to flow together and run down the evaporator plate without dropping off.

Should you run into any complaints of water dripping from the top surface of an evaporator plate, dull the surface by sanding it carefully with fine sandpaper, such as No. 280. Rub from front to back so that the tiny scratches are in the direction you want the water to flow. This is quite important.

(Continued on page 36)

COMMERCIAL

INCREASE BUSINESS BY DOING A MORE EFFECTIVE JOB OF SELLING *Selling*

Tuned to War Times Service Company Begins Expansion

This concern has doubled previous year's volume three times in a row by dividing sales emphasis to include all but new home market.

By B. K. Anderson

CAN a refrigeration service company plan how much business it will do in a certain period, and then have the books show that it has completely achieved this goal, particularly if the demand is as much as a 100 percent increase over the previous similar period's volume?

G. T. Rostock, owner and manager of the Blue Flash Refrigeration Sales & Service Company, Kansas City, Missouri, answers this question with: "That has been our record from the day we opened our doors in 1938."

And Mr. Rostock doesn't ask you to take his word for it. His books, like every other function of the firm, are specialized. They were set up, and are still directed by an experienced accountant, just as the Blue Flash shop is directed by an experienced air conditioning and refrigeration engineer, and the commercial refrigeration selling is done by a full-time employee who does little else except call on all sorts of business firms and ferret out their refrigeration needs.

Mr. Rostock, who is himself a refrigeration sales engineer, having been a former student at Tri-State Engineering College, and Schrieber's, and later followed this schooling with the field staffs of Frigidaire and Brunswick, is convinced that the most important function of the refrigeration industry is not the selling of such-and-such equipment, but the basic selling of refrigeration itself.

In laying out his firm's plans for 1942, this was the first consideration. Every plan was put to the test: "Is this merchandising of refrigeration or is it competition between particular makes of units?" If the former was the case, well and good; if the latter held true, the plan was junked.

Next in importance comes the test of "balance." To this firm "balance" means dividing of merchandising efforts to include: Sale of used commercial equipment; sale of new commercial equipment; sale of used refrigerators for homes and apartments; sale of commercial refrigeration service; sale of dwelling refrigeration

Windows are aimed at commercial and domestic balance at Blue Flash Refrigeration Service. Sale of repaired used equipment accounts for a large share of the firm's profits.

service; and sale of air conditioning both new and used, as well as service.

In view of war conditions, rising prices and labor costs, and other operating costs including taxes, scarcity of certain materials, increased demand in the field for used equipment, and other circumstances associated with war time operation, a rescheduling of all prices was put in order.

But before these plans were completed all of 1941's objectives were checked so that mistakes and lessons learned in their operation might serve to guide in the new year's planning. Here is the basic plan of objectives used by Blue Flash:

1. Are the expense and sales effort expended to achieve a 50-50 net profit balance between commercial and home refrigeration volume proved out by our books? In 1941 this firm found that commercial work and sales proved a better investment per sales promotion dollar spent. Thus 1942's plans call for more emphasis to be added to the commercial program. On the other hand the firm showed a very small margin on maintenance contracts and is not renewing these as they run out.

2. In all programs has there been sufficient planning in advance to guarantee our full profit on every job and sale? This firm does not believe in price bidding on jobs. This is the reason it does not now sell new home refrigerators. It will not take a job or make a price until it is certain it will come out with its regular profit.

3. Have we in any section allowed our stocks and inventories to get below our year-ago levels? This firm has always turned more than 60 percent of its net profit into building up stocks of parts, shop equipment, and new and used units. The firm's books show that these purchases have never lost value and in more than 80 percent of the cases have gained in value.

4. Are we getting all of our commercial customers' refrigeration business? The full time employee charged with commercial contacts does not go to the customer in a "selling mood." He goes there to talk over the customer's refrigeration problems and needs. In other words he helps acquaint the customer with his needs and sells him before the customer is faced with the necessity of plunging into the open market to buy from just-any-body.

5. Have we sufficient supplies of used equipment needing service, and owned by us, on hand so that any shop slack can be taken up without loss of employee time? This firm has regular customers throughout its trade area from whom it purchases used air conditioning and refrigeration equipment. Often these firms will write in when they have a surplus of trade-ins. But to make sure of adequate supplies of

used stock, a regular buying round of calls is made once every 60 days or less. Buying is where selling begins, in the Rostock book, and these customers include: Appliance dealers, power companies, mail order houses, furniture stores, small and large sales firms of all types of equipment, department stores, etc.

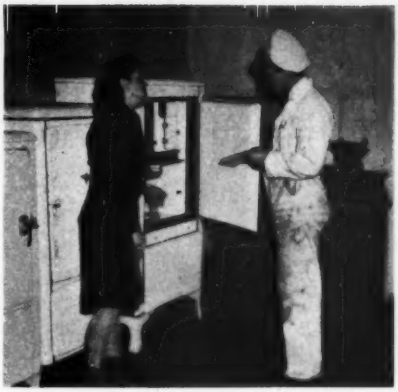
Basically the annual planning works out from these rules. Of course, there are other minor considerations such as those occasioned by war conditions. For instance, the air conditioning market of 1942 began months early at Blue Flash. Customers gave the impression that they feared a shortage and wanted to be sure to get their installations. This fact was taken into consideration in both price of jobs and shop schedule.

It was partially due to these conditions that maintenance contracts were not renewed and the company has planned not to renew them until they find themselves in a position to get at least $10,000 worth of this business annually and are able to set aside an amount equal to this gross to take care of unforeseen circumstances that might develop. Until the war is over this firm has decided not to take any work that does not assure it its regular profit.

In the face of war industry needs, Blue Flash is concentrating particularly on buying used equipment that has failed in service and is not in operating condition at time of purchase. The firm's books show that break-down rather than aged trade-in equipment can be put in good working order and will bring a better price. Also break-down equipment usually has just one or two things wrong with it that mechanics at the spot couldn't locate and can be bought at a better price.

In buying used refrigerators, which they feature as a major operation, Blue Flash always tries to buy them in volume, again because of the better price angle. The usual practice is to buy all the dealer's trade-ins that he wants to sell at a flat price never exceeding $10.00 per unit.

With the exception of extensive motor work such as rewinding, the Blue Flash Shop does all its own work, and plans it in such a way that the refrigerators ready for sale never cost them more than $15.00.



"Show used refrigerator prospects 'frost' in the box" advises G. T. Rostock of Blue Flash Refrigeration Service Company, Kansas City. And that's just what he's doing.

This cost divided is $1.00 transportation, $4.00 shop and parts, and $10.00 for the refrigerator.

Classified newspaper ads are used for sales stimulators exclusively. These ads are run in the Friday papers because most other firms advertise used refrigerators on Sunday, and because the Friday ads have proved to be strong pullers of Sunday trade.

The refrigerators are never featured as renewed. They are used refrigerators, and treated as such. Experience has proved to this company that most trade-ins only have one thing wrong with them and when this is fixed the unit is in operable condition. In the case of a badly scarred cabinet, it may be touched up, but usually the mechanics are put in working order, the box given a good but not extensive cleaning, and then, if an ad is being run, the box is hooked into the power line so that it will have frost on it when the prospect comes to make the purchase.

All used refrigerators are in operation at time of sale, which helps sell, cuts down kick-backs, and serves as final shop check on them. The average Blue Flash used refrigerator sells for $37.50. Ten percent of the customers trade-in an old box on the purchase for which they are allowed up to $10.00.

Seventy-five percent of the sales are cash. Delivery is extra, $1.50 for small refrigerators, and $2.00 for the larger ones. On the time payment plan the customer must pay $10.00 down payment and $5.00 interest and handling charges at time of purchase. The balance must be paid in 6 months.

A 90-day guarantee is given on all units and the firm books show that the vast majority of customers call back here for service after that time. It is not unusual for customers to buy and trade in identical boxes. Service calls on the 90-day guarantee are practically nil.

In 1939, Blue Flash did not sell any used refrigerators. In 1940, they fixed up a batch of 15 and sold them out with their first ad, but it was late in the season and they planned then for 1941, during which period they sold 162 units. This year their plans call for the sale of 300 used refrigerators. 100 of these were cleaned and repaired during the winter months, and the firm expects to fill stocks as it goes along.

"Used" Refrigerators Sold

It is always emphasized to the customer that he is buying a used refrigerator, not a re-built refrigerator, and the same applies to the commercial sales of used equipment. This point is always stressed to maintain customer good-will and maintain the company's planned profit system. They are pointing specifically to customers who want to buy refrigeration and not such-and-such a unit. Even in parts and service this point is made extremely clear on the statement and in conversations with the customer. He always knows fully whether it is new or used he is buying.

Realty firms have proved excellent volume customers of used refrigerators. Seldom does the firm get a good supply of suitable refrigerators on hand that it cannot sell to realty customers through a few phone calls. Volume purchasers are allowed a 15 percent discount. Blue Flash's record of sales since war period began also show that refrigeration customers now are not so much interested in new equipment as they are in taking care of present refrigeration needs. Purchasers are looking toward much shorter time objectives.

A very important new market for used refrigerators is in defense areas where one-family dwellings are being converted into apartments. Highly price-conscious, these customers leap at the chance to buy low-cost refrigeration. In fact, it has been this company's experience that it can easily sell via Friday newspaper ads, letters and calls to realty companies, and contacts with owners of newly converted to apartment dwellings, all the refrigerators it can get and put in operating order. Featured in the newspaper advertising is the heading: "Trade, terms, and bargains in used refrigerators."

Contacts Made Regularly

Contact with the commercial customers, in addition to their personal contact man, is via direct mail every 30 days. This may be a blotter, a calendar, or some other mailing piece to keep Blue Flash's name fresh in the commercial customer's mind. Because this business is the most profitable, Mr. Rostock plans that when his service and sales from this source aggregates $30,000 in a single year he will concentrate his entire service attention to it.

His service department now uses five service men during the warm months. Service calls are set at a minimum of $2.00 each, and a full record is made at each stop. This record is then taken to the office and transferred to a permanent file. It includes name, address, and telephone number of customer, make, year, and model of refrigerator, and all types of notes such as general condition of unit, apparent financial condition of the customer, and such information as could be used to aid in later selling the customer used or new unit.

Although Mr. Rostock is making no present effort to sell these customers, it is his plan that when war needs no longer restrict the manufacture of new home refrigerators, the service firm's day of sales will be at hand. At present this extensive file is of little use but is just part of this policy of planning ahead.

He is convinced that now it's the service firm that has the customer contact and information as to market needs and all the advantages of the after-war market will be in the service firm's lap, provided—the service firm is foresighted enough to prepare for the market.

Other of his measures for the war period include full inventories in stocks such as pipe connections, joints, valves, etc. This saves much time in securing equipment needed for repairs. Trade-ins of all sorts are encouraged in all lines. However, repair of parts is not suggested to customers unless it is certain that the repaired part will stand up in operation.

In commercial jobs particularly, Blue Flash is now encouraging customers to buy service on an interchange of units basis. This allows for a fuller profit on these jobs and reduces shop overload during this period of labor and parts shortage and high labor and parts cost. Sectionalized space in the service section of the phone book has been increased due to the firm's conviction that customers are now making every attempt to keep their equipment in better maintenance and operating condition.

As to what Mr. Rostock expects to develop during war period for the refrigeration service engineering firm, he says: "Service calls have and will continue to increase considerably. Demand for used equipment will more than double. Many dealers may shift to other lines which will eliminate them as competition. Minimum service call charges will advance at least 50 percent. Margins of profit will be widened. More attention will be given by the firms to their purchasing. It will no longer be necessary to take a gamble on any job, the unprofitable ones will be turned down. And if the service firms devote a little of their time and efforts to building good will with their service call customers, they will prepare for themselves one of the greatest markets for new equipment that the history of this business has ever seen."

Novel Installations Build Reputation

By Robert Latimer

ALONG with guaranteed installation work, advertising, and the ability to solve tough refrigeration problems, the refrigeration service firm needs a little "showmanship" to get additional business in today's abnormal conditions, according to George W. Mims, president of Mim's Frigid Refrigeration Service Company, of New Orleans, La.

Mr. Mims is fully aware of the appeal of novelty installations to prospective customers. Therefore, whenever his firm, largest independent organization in the Louisiana metropolis, handles refrigeration contracts with a "human interest" angle, he believes in letting the public know about it. For example, when the firm installed a huge ice-skating rink refrigeration system in record time, Mims photographed the layout, and got several New Orleans newspapers to run copy on the job. When he was called in to solve a vital problem for refrigerating blood in the city hospital, he went through the same process. By thus continually publicizing his firm, he believes, the name of Frigid Refrigeration Service is carried to thousands of people who ordinarily might never hear of the firm, and goes a long way toward guaranteeing that when such people have need for refrigeration or installation service of any kind, will remember the company.

"It pays in a lot of ways to let the public know what you are doing, and what you can do," Mr. Mims told this reporter. "We have always found that we develop more business immediately following a bit of

(Continued on page 34)

Take It From Me, Mr. Re

M. O. Keefe

SALES MANAGER

THE

THIS

To[illegible], busi
A[illegible]rica a
S[illegible]e our
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FEDDERS MANUFA

Mr. Refrigeration Man...

THERE IS BUSINESS!

AND

THIS MAP PROVES IT

Today, business is as good as you make it! Refrigeration men right across America are busy on defense installations and essential civilian service. Since our recent "Immediate Delivery Folder" was mailed, unit cooler orders have been flowing in from refrigeration men in lots of from "a

twelfth of a dozen" up to 105 each from these cities from coast to coast—Take it from me, there is Priority business RIGHT IN YOUR CITY RIGHT NOW!

IMMEDIATE DELIVERIES

ON FEDDERS UNIT COOLERS

ORDER NOW—FIRST COME, FIRST SERVED

ANUFACTURING CO., INC., BUFFALO, N. Y.

Novel Installations —*continued from page 31*

The "land yacht" of a wealthy Oklahoma rancher in which Mims installed a refrigerator.

publicity of this kind than at any other time." He pointed out at the same time that under war conditions, with less installation of equipment, the average refrigeration service firm needs more public notice to insure larger amounts of service business—as many new customers as possible.

During the past several years, Mims has pushed along this publicity theme aggressively himself, by use of clever direct mail folders slanted at commercial refrigeration users. Whenever the company installed a new meat case, for example, Mr. Mims had it photographed with the owner, cuts made, and printed in a folder pointing out the features of the installation, how it was handled, and including a testimonial from the new owner as to how it had helped his business. These were printed in two colors, and sent out immediately to every butcher in the city. Mr. Mims then followed them up himself or sent a salesman out to see prospective customers. Even if no sale was made, he feels, the average butcher is impressed by this mailing piece and picture, and will keep the unit recommended in mind until he can afford to make the installation. The same policy was used with grocery store and super market installations, with ice cream cabinets, liquor stores, restaurants, etc. The personalized direct mail folders cost Mr. Mims more than any other form of advertising per prospect reached, but he feels that the cost has been well repaid by the service business obtained, let alone actual equipment sales. Few refrigeration users in New Orleans do not know Mr. Mims as a result.

Still another phase of "showmanship" which has counted heavily on the profit ledger is concerned with novel specialty refrigeration systems or air conditioning, which Mr. Mims encourages at all times, not only because of the higher profit obtainable, but because such jobs invariably create a lot of respect for the service firm. Thus in addition to selling equipment and service, Mr. Mims goes out aggressively after novelty installations from cooling a passenger river boat to an air conditioned dog house.

Typical is a two-ton air conditioning installation in a prominent New Orleans manufacturer's Cadillac sedan. Hearing that this man was interested in a practical means of cooling his car over continuous long summer driving trips, Mr. Mims telephoned him and suggested several ideas—showing enough interest that the manufacturer came in the next day. The result of this conversation was a two-ton cooling unit driven off the car's fan shaft, providing refrigeration for two direct expansion coils, one under the hood and one in the rear deck of the five-passenger sedan. Fresh air (100% fresh air is used) comes into the car through a duct extended to the front grille over the radiator, passing the air over one series of coils, into the automobile through the ideally-diffusing

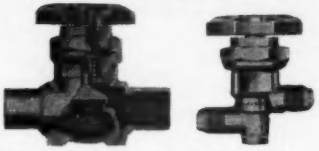
Superior PRODUCTS ★ ★ ★

★ ★ ★ FOR YOUR *Defense* JOBS

Increased refrigerated space for the accelerated production of perishable foods places a heavy responsibility upon the refrigeration industry. Shortage of metals condemns waste and inefficiency. Do your part to conserve materials. Design to produce more refrigeration per watt hour. Select equipment which requires a minimum of service. Specify SUPERIOR — the quality buy-word of the industry.

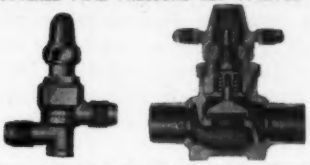
CUT

DIAPHRAGM PACKLESS VALVES



Entire internal assembly removable for soldering or inspection. Equipped with famous pressure cup below diaphragm. Two and three way. Flare sizes ¼" to ⅜"; Sweat sizes ¼" to ⅞".

PACKED AND PRESSURE CUP VALVES



Flare and sweat sizes ¼" to ⅞" (two and three way) have hex seal cap. Sweat sizes ¼" to 2⅛" (globe) have wing nut seal cap. Internal assembly (all sizes) removable for sweating to valve body.

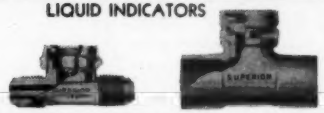
★ *Refrigeration is Vitally Essential to Our National Defense Efforts* ★

OUT AND SAVE

CHECK VALVES

Very sensitive springs. Less than 5 ounces pressure drop. Positively will not chatter or hum. All internal parts easily removable for sweating or inspection. Sizes ¼" to ⅜" Flare; ¼" to ⅞" Sweat.

LIQUID INDICATORS



With or without seal cap. Flare sizes ¼" to ⅝"; Sweat sizes ¼" to 1⅜". On ½" Sweat to 1⅛" entire upper assembly may be removed as a unit to facilitate soldering of refrigerant lines to connections.

★ *Refrigeration-Food Preservation and National Defense are Synonomous* ★

FOR FUTURE

DEHYDRATORS

Silica-Gel or Activated Alumina. Refillable and non-refillable. ⅛" to ⅝"; ¼ to 5 H.P., 2 to 60 cubic inches.

MANIFOLDS

With packless or seal cap valves. Two to six valves; ¼" to 2⅛" valves, with or without end fittings. Sweat or flare.

FILTERS

Highly efficient sock type filter. Sizes ¼" SAE to ⅝" SAE. One to five horsepower.

★ *Don't take chances with the Nation's Health -- do the best job possible* ★

REFERENCE

FITTINGS

Unions, adapters, elbows, tees, crosses, caps, etc. ⅛" through 1".

HEAT EXCHANGERS

Unique design gives highest capacity per unit size. Sweat or flare connections. 4200 to 9725 BTU per hour.

Combination Heat Exchanger and Accumulator. From one to ten tons. Especially recommended for low temperature installations.

FLARE NUTS

Brass and steel. Long and frost proof. Forged and bar stock.

★ For complete details—see your Jobber or write for catalog ★

SUPERIOR VALVE & FITTINGS CO.

★ PITTSBURGH ★ PENNSYLVANIA ★

defroster hose connections, where it is circulated and recooled by the second coil bank behind the back seat. Mr. Mims spent a lot of time in designing this unit, including a two-speed clutch for economy —with the result that the car was driven 30,000 miles without need for repairs, in a single year. This novel installation got a huge amount of publicity, and was even featured in a magazine section of the local newspaper.

In another case, when the use of a portable x-ray machine mounted in a heavy bus by the Louisiana State Board of Health was threatened by the high summer temperatures of 1941, Mr. Mims stepped in and solved the problem. Handling charity tuberculosis and other patients in the state, the bus made x-ray examinations on the spot and developed the negatives in a tank which was part of the x-ray setup. High temperatures, however, ruined the efficiency of the developing fluid, with the result that only poor negatives or none at all were obtained. For this urgent need, Mr. Mims designed a ½-ton Westinghouse direct expansion cooling system, connecting the compressor under the chassis of the bus with a series of copper tubes soldered to the metal developing tank. Providing the bus with a long extension cord for power to operate the refrigeration unit made it possible for the x-ray unit to plug in at almost any location, and cool the developing fluid down to the proper 72 degrees. Pictures of this installation were widely circulated around the state, and quickly brought in more portable refrigeration work.

As an example of how far-reaching such publicity has been, one of Mr. Mim's most recent unusual jobs was installation of a 5-foot refrigerator and a Peerless evaporative cooler in the "land yacht" of a wealthy Oklahoma rancher. The land yacht was a rolling palace complete with every facility from electric range to air conditioning—yet when the refrigeration failed to operate practically, the rancher came all the way to New Orleans to have Mr. Mims replace the original installation with one which has never brought a complaint.

STEWART WARNER REFRIGERATOR

(Continued from page 26)

Sand thoroughly to cover the entire top surface and for an inch or so below the bend, but be very careful that you do not go through the enamel, which is quite soft. Sand only until the gloss is removed from the surface.

After the sanding operation is completed, it is a good idea to wash the surface carefully with a mild soap and water to take off any dirt or grease that may have come from your hands.

Sterilamp Data

The Sterilamp with which these refrigerators are equipped, is good for about 4000 hours of burning. This does not mean to say that the lamp will burn out after 4000 hours, but they do lose their effectiveness. Since the Sterilamp burns only when the unit operates the lamp is good for about two years' service and it is advisable to replace it every two years whether it has burned out or not.

Cleaning of Sterilamp: To make full use of the bacteria and mold killing effects of the Sterilamp it is necessary to clean it carefully every two weeks or so, even though it may appear perfectly clean. This cleaning is necessary because the ultra-violet radiations from the Sterilamp are completely absorbed by even invisibly thin layers of surface scum and dirt.

Sterilamps Used in Dual-Temp Models: Two different types of Sterilamps are used in the 1940 Dual-Temp refrigerators. These two Sterilamps are not electrically interchangeable and use different bases. Therefore, when ordering Sterilamps, you must specify the type you want by giving the correct part number.

All 50-60 cycle 1940 Dual-Temp refrigerators having serial numbers below 593193, except for about 250 in the serial number group between 592819 and 593191, use a standard lamp base Sterilamp (Part No. 120092). Do not use any other Steri.amp in these early refrigerators. All 25 cycle Dual-Temps, regardless of serial number also use this No. 120092 Sterilamp.

All 50-60 cycle 1940 Dual-Temp refrigerators having serial numbers above 593193, and also all 1941 and 1942 Dual-Temp refrigerators, use a 220 volt Westinghouse Sterilamp, Part No. 121068 with a small intermediate base. A special constant cur-

MEET *All* INSTALLATION CODES

Weatherhead valves, fittings and accessories are made to meet the refrigeration codes of all cities.

Valves include angle, two-way, three-way packless, compressor, by-pass, check, receiver tank and relief types.

Fittings have an exclusive flat-sided construction that provides no slip—no strip—no leak installations.

Accessories include pipe flanges, adapters, receivers, charging hose, manifolds and testing valves, all finely machine finished.

THE WEATHERHEAD CO.

300 East 131st Street
CLEVELAND, OHIO

WEATHERHEAD

Refrigeration Valves, Fittings and Accessories

TABLE 4—STERILAMP REPLACEMENT DATA

Part No.	Lamp Base	Lamp Length	Used in	Voltage Rating	Operation
120092	Standard	7½" for G. E. ..... 6½" for Westinghouse....	Early 1940 and Some Model 769..	115	115 Volt
121068	Intermediate ...	8½"	Late 1940. All 1941 and 1942	220	Transformer & 115 Volt
120332	Intermediate ...	6½"	Some Model 769....	80	Resistor & 115 Volt.

rent auto-transformer is mounted in the dome just beside the Sterilamp socket to supply the 220 volts. This Sterilamp cannot be used without this special transformer. It will not operate on 110 volts and it will be seriously damaged if operated directly from a 220 volt supply.

The No. 121068 Sterilamp is not interchangeable with the intermediate base Westinghouse Sterilamp, Part No. 120332, used in the 1939 Dual-Temp refrigerators. The 1939 Sterilamp, Part No. 120332 is rated at 80 volts and should not be used in a 1940 refrigerator with the 220 volt transformer.

WATER IN FOUNTAIN SYSTEMS

IF you have had trouble with water getting into a soda fountain system and have been unable to locate the point of entry this suggestion may be of value.

In the old flat top "F" or "M" models of Temprite coolers the stainless steel soda water coils were inserted into a boss as indicated in Fig. 1 and silver soldered. Occasionally, for some reason, the steel tubing at the point of soldering begins eating away until a leak occurs through the tubing. The stainless steel soda water coil in these coolers is surrounded with refrigerant at about 30 lbs. pressure during normal operation while the soda water in the coil may be at a pressure as high as 125 lbs. This differential forces soda water out of the coil through the leaky tubing into the refrigerant. This trouble occurs on only a few of the old models and has been corrected on later models.

The best method of testing for such leaks is to remove the soda water connection at the top of the cooler and allow the cooler to warm up in order to increase the refrigerant pressure in it. Take a drinking glass full of water and fill up the soda water coil to the level of the outlets, then watch for bubbles rising to the surface.

The new method of connecting this tubing to the dome of the "FA" or "MA" models completely overcomes this trouble. These later models are recognizable by the curved dome or top and the new method of connecting the tubing is illustrated in Fig. 2. Here it will be noted the dome is drilled and countersunk to a depth of about ⅜ inch. The tubing is inserted through the dome, the countersink filled with silver solder, then the top surface is machined flat.

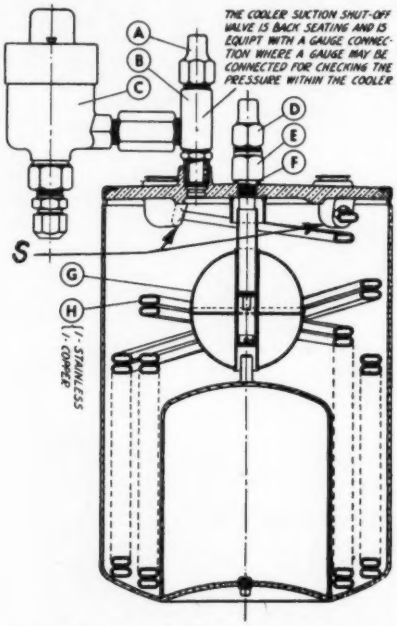


Fig. 1—The point "S" locates the usual location of leaks in these coolers.

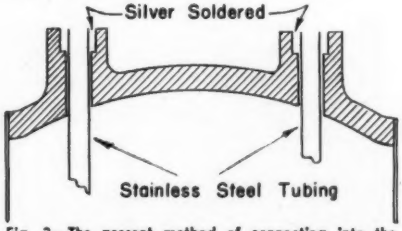
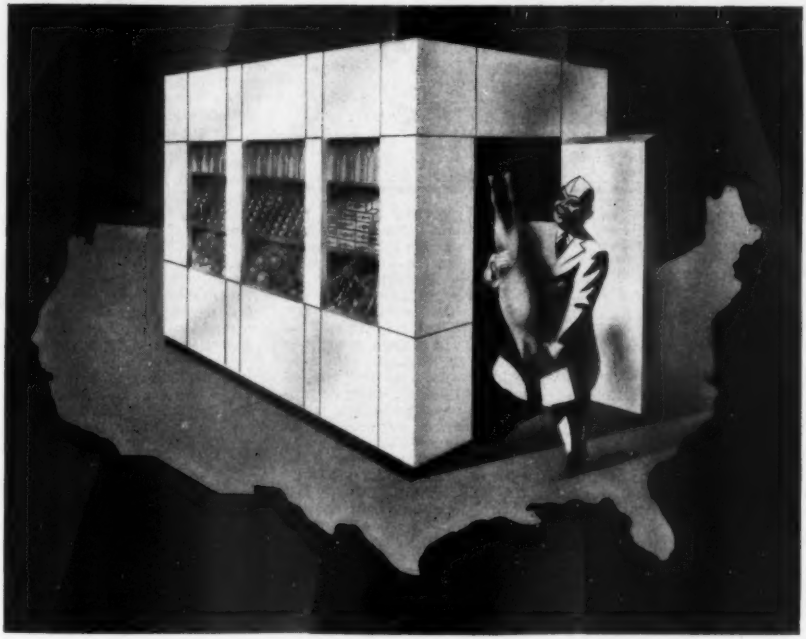


Fig. 2—The present method of connecting into the dome.



is refrigeration essential?

If the health of the nation is important . . . if the prevention of food spoilage is a vital necessity . . . if waste is a direct blow at defense . . . then there can be no question but that refrigeration *is* essential . . . emphatically so! . . . Today, America literally lives out of a refrigerator. The uninterrupted flow of perishable foods from producer, through distributor, to consumer depends solely on the continuous functioning of refrigeration . . . mechanical refrigeration. And, there is no available substitute. . . . The unprecedented need for refrigeration by our armed forces was bound to cause a scarcity of parts and materials for civilian use . . . but, the maintenance of existing refrigeration equipment, at least, is a MUST . . . *Defense demands it!*

HENRY VALVE COMPANY
1001-19 NORTH SPAULDING AVENUE • CHICAGO

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING • ALSO AMMONIA VALVES AND FORGED STEEL FITTINGS

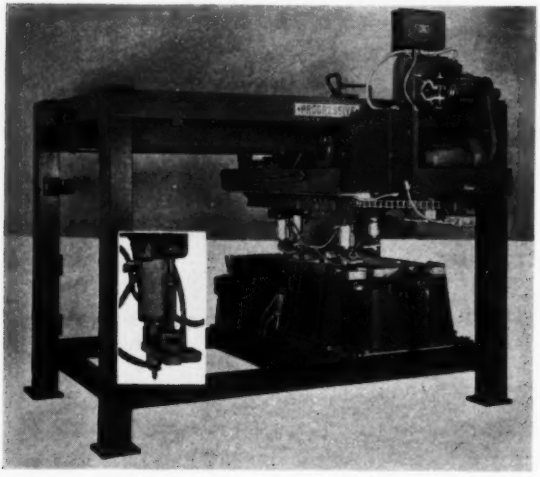
New and Improved Appliances

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

They Weld as They Walk

KNEE-ACTION, walking welding guns are the latest innovation in the resistance welding field. Developed by Progressive Welder Company, Detroit, they permit the performing of multiple welds in sequence in an automatic machine, where it is preferable to hold the work stationary in large fixtures. The manner in which this is done is illustrated in a machine developed for welding the back panel into a refrigerator shell.

The machine is designed to handle two sizes of such shells, and welds one assembly while another is being loaded and unloaded. Shell and back panel are dropped over the locating fixture, which incorporates the lower electrode. Clamping is by air pressure. (One fixture has been removed here to show the clamping mechanism at the side of the fixture.) When a button is pressed, the entire operating head of the machine moves to a position above the loaded fixture. Pushing another button starts the automatic welding operation. The four gun points come down and make four welds (pairs of guns weld in series). At the same time the chain shown has started to move. The motion of this chain is continuous, carrying the heads of the welding guns along. Weld time is controlled by an electronic timer. When the weld is completed, the pressure is off the gun points, and these points swing—under spring pressure—to a new position farther along (depending on the amount the chain has moved). Another weld is made automatically, and the guns take another step.



Knee-action welding guns "walk" around in this automatic welding machine and make a weld every time they take a step.

Note the parallelogram construction at the guns, which permits the top of the gun to move while the electrode is stationary.

To complete one assembly, each gun takes 19 steps and makes 20 welds, 1½ inch apart. While the shell is being welded, the other fixture is being unloaded and reloaded. The machine operating head now moves above over the second fixture and repeats the cycle, except that the movement of the guns is now in the opposite direction, the chain reversing its travel at the end of each complete cycle of welds. Off-time, between welds, to permit the guns to move on to the next spot before welding current comes on, is controlled automatically by a notched timing disk.

Time for the complete welding cycle is approximately 12 seconds, during which time 80 spot welds are made.

Storage for Blood Plasma

A NEW low temperature electric refrigerator specially designed for quick freezing and safe storage of blood plasma is announced by the Jewett Refrigerator Company, Inc., one of America's foremost manufacturers of hospital refrigeration equipment.

Simple, practical design, and elimination of expensive

"The Chart is a necessary part of my equipment"

so says this service man

• Now that the Calculator is being put to the test of practical use in the field, we have had a number of letters from service men testifying to its value. This one is typical.

Sometime ago I purchased a Head-Back Pressure Calculator from you, but misplaced it. The chart is a necessary part of my equipmemt, so please send me another.

J. V. Farmer

WRIGHT'S

H. B. P.

CALCULATOR

The purpose of the Head-Back Pressure Calculator is to quickly determine the proper head pressure, for the following refrigerants when the suction pressure, room temperature or mean water temperature is known.

Carrene	Methyl
Isobutane	Freon or F-12
Sulphur Dioxide	Ammonia
Carbon Dioxide	

Actual Size 3½" x 3½".

A Vestpocket Tool Every Service Man Should Carry

A number of troubles can be detected by comparison of the existing head pressure and what the head pressure should be, but in the past there has been no convenient method available to the service engineer to determine what the correct head pressure should be. Such variable conditions as the suction pressure, room temperature, water inlet and outlet temperature, kind of gas used, etc., all determine the proper head pressure. It is not practical to depend on one's memory of other similar conditions or to just use snap judgment when this handy calculator gives you the correct answer so easily. Send for it today! Sturdily constructed, with oil-proof finish, for on-the-job use.

POSTPAID $1.00

NICKERSON & COLLINS CO.

435 N. WALLER AVE., CHICAGO

gadgets results in low prices and makes these blood plasma refrigerators economical for small as well as large hospitals. Two sizes holding 120 or 240 bottles of 300 c.c. capacity are available.

Adjustable temperature control provides temperatures ranging from 0° F. down to —10° F. (—18° C. to —23° C.). These temperatures are well below the allowable maximum. The photograph shows that these trunk type blood plasma refrigerators are specially designed for clinical use. Note how single lid gives instant access to interior. Self-contained, sealed unit in base assures quiet, trouble-free operation. No oiling, no belts.

Complete information on Model 3-A three cubic foot and Model 6-A six cubic foot sizes available by writing The Jewett Refrigerator Company, Inc., 2 Letchworth Street, Buffalo, N. Y.

Bonney Socket and Tool Set

A RECENT addition to the Bonney Line is the 74 piece socket and tool set illustrated, known as the No. BB1 Set.

Every piece included has been selected because of its general utility value in service work of all kinds. It makes a fine basic tool kit for the experienced mechanic who requires new tools or the newcomer in the service field who is just starting the assembly of a complete tool kit.

Included in the No. BB1 Set is an assortment of 14 sockets with double hexagon openings from 7/16 inch to 1 inch; 3 extra-deep sockets with double hexagon openings from 13/16 inch to one inch; 2 sockets with ½ inch and 9/16 inch double square openings; 15/16 inch drag link socket; 14 inch brace; 11 inch sliding "T"; 5 inch and 10 inch extensions; cross handle; universal joint; hinge handle and reversible ratchet. All the above mentioned sockets and attachments are in the popular ½ inch square drive.

In addition it includes 4 TuType Wrenches (combination box and open end) with openings from 7/16 inch to ⅝ inch; 6 ZENEL Engineers' Wrenches with openings from ⅜ inch to one inch; 4 ZENEL Tappet Wrenches with openings from ½ inch to 11/16 inch; 5 Bonaloy Box Wrenches with openings from ⅜ inch to one inch; 4 assorted chisels; 7 assorted punches; one pry bar; 8 assorted screw drivers; 3½ oz. and one lb. ball pein hammers; one adjustable plier; one ignition plier; one adjustable hack saw frame and blade and one standard feeler gauge.

The entire assortment of 74 pieces is furnished in a strong metal box measuring 22¾ inch x 10¾ inch x 9 inch. It has removable tray, lock and two end carrying handles. Complete, the set weighs 57 lbs.

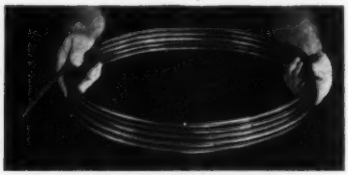
Steel Tubing Offered by Imperial

A COPPER coated, tinned, soft-tempered steel tubing, which can be used to replace copper tubing for many purposes, has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. This tubing, known as Imperial Bundy Tinned Steel Tubing, is said to meet the requirements of such refrigeration applications as cooling coils, condensers and connecting lines. It can be used with freon, butane and methyl chloride (but not with ammonia).

Tubing is copper coated inside and outside and has an additional tinned coating on the outside. The extra tinning fills in the seam of the tubing giving fittings a tighter, leakproof grip. It is pointed out that where extreme corrosive conditions are encountered, additional protective coatings should be applied.

Tubing is soft-tempered and can be bent, flared, coiled, soldered, brazed and welded. In flaring, the use of an Imperial 93-FB flaring tool, which is designed especially for this purpose, is recommended.

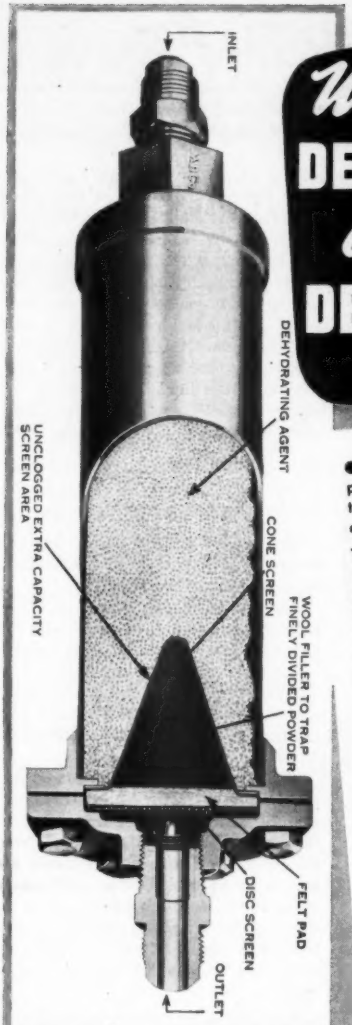
This tubing is stronger than copper tubing, it is reported, and has a higher resistance to vibration fatigue. Bursting strength ranges from 17,800 to 8,700 lbs. per sq. in. depending on size.



It is furnished in 25 ft. coils in ⅛", 3/16", ¼", 5/16" and ⅜" O. D. sizes and is available for prompt shipment. Catalog pages, giving complete information, can be obtained from Imperial Brass.

L. J. Helfer
River Grove, Ill.

We like the New Appliance Section. It keeps us up-to-date on equipment.



When You Buy DEHYDRATORS Also Buy DEPENDABILITY

● Mueller Brass Co. Dehydrators are provided with a greatly improved feature...THE CONE SHAPED SCREEN, as illustrated here.

The cone shaped screen filled with pure wool, directs the fine particles of the drying agent to the outside of the base of the cone. Any particles that pass through the screen will lodge in the wool filler without clogging, leaving the center free for the passage of the refrigerant.

We build a complete line of reliable dehydrators, and they are sold at a fair price. We know the consumer does not want an inefficient dehydrator even at the saving of a few cents, and we don't believe that you would knowingly risk the possible loss in dollars as well as in reputation. A small increase in cost necessary to make any device thoroughly reliable is always justified. When you buy dehydrators, also buy that dependability which is built into all Mueller Brass Co. time-tested refrigeration Products.

MUELLER BRASS CO.

MUELLER BRASS CO. REFRIGERATION PRODUCTS

Your jobber deserves your patronage. He assembles thousands of products of hundreds of manufacturers from all parts of the country. He stocks them under one roof so that you can get what you want in a hurry, and at the right price.

PORT HURON, MICHIGAN

The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment to "The Question Box."

CORRECTION TO QUESTION 476

QUESTION BOX: The reply to the second part of question 476 seems to confuse the Fedders cartridge needle that can be inserted directly into the header and used on Norge and other evaporators with the Kelvinator evaporator.

The Kelvinator requires unsoldering the float header, installing new needle and seat

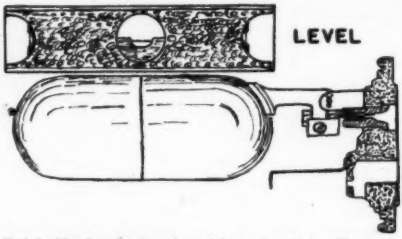


Fig. 1—The header is gripped in a vise and calibrated through the use of a level.

and recalibrating the float. I have calibrated it by clamping the header in a vise, float on top as in Fig. 1, and adjusting the needle so that the float ball is level. It is obvious, of course, that the work bench and vise must be level if this setting is to be correct.

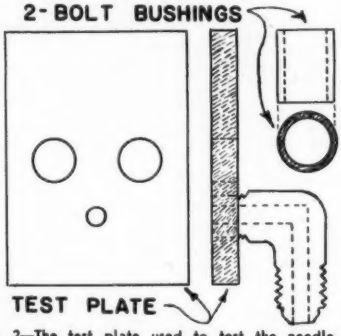


Fig. 2—The test plate used to test the needle for leaks.

This has, in most instances, been right, but occasionally a header may have to be removed again due to frost back, and the setting slightly changed.

It is also wise to make a plate as in Fig. 2, to bolt on the front of the header, plate to have one-eighth inch pipe tap hole in which can be inserted a one-eighth pipe by one-quarter SAE fitting. Same to fit directly over a hole in the header into which needle seat was screwed. By bolting this plate on the header while it is in the vise, attaching an air hose to fitting, you will be able to see that needle closes off by the mere weight of the float ball. Testing with oil as other needle valve tests are made, it will show whether or not the needle is holding.

E. A. Plesskott
St. Louis, Mo.

NORGE PUMPS OIL

QUESTION 479: How can I get a better oil return on a Norge Rollator Refrigerator Model about 1931 or 1932?

The above Rollator and coil were completely dissembled, cleaned and washed, a new seal was installed, a new valve reed and new check valve in suction line was installed, charged with new 150 viscosity oil and new gas, all in the amounts specified in the 1937 issue of the THE REFRIGERATION SERVICE ENGINEER.

The above refrigerator worked through all the hot weather for about three and a half months, when the Rollator began a clicking noise and would not pump. When oil was added the unit would quiet down and would return to normal, but in an hour or so the same thing would happen. Even filling all the trays with boiling water will only return the oil to the Rollator to bring about quiet operation and satisfactory operation for 24 hours or so.

The float valve needle and seat assembly that were found in an original freezing unit are used.

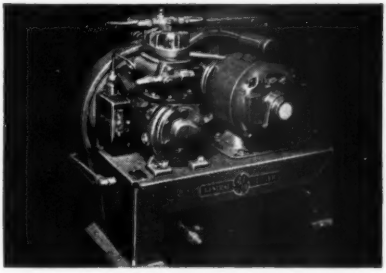
ANSWER: I don't believe your trouble is in the evaporator because if the evaporator is not returning the oil properly, you would experience a higher than normal evaporator temperature, long running periods and lower than normal suction pressure. You have not mentioned these and I take it for granted they are O.K.

If your trouble is in the evaporator, however, it will be necessary to recalibrate the

3 Ways you can help speed PRODUCTION for VICTORY with G-E "Scotch Giant" condensing units

1 Suggest new industrial installations—to improve war products, speed production, reduce spoilage.
2 Provide changeover parts—for present equipment that may be adapted to war production.
3 Furnish trained service—to keep present G-E equipment operating at maximum efficiency.

Here's your opportunity to play an important part in our gigantic war program! Almost daily we hear of new war-time applications of commercial refrigeration and air conditioning equipment—applications that improve war products, speed production, reduce spoilage.



Apply your own knowledge and experience in this highly specialized field to the most important task that has ever faced this nation—"Production for Victory!" It's an unrestricted market with tremendous opportunities for the alert refrigeration service engineer!

General Electric "Scotch Giant" condensing units are designed to provide trustworthy, economical, long-lived refrigeration—at low cost—for industrial processing, food preservation, comfort cooling. The complete line includes air and water-cooled models in ratings from ¼ to 125 horsepower.

GENERAL ELECTRIC

Dept. 2713, Bloomfield, N. J.

float, raising the liquid level at which the float shuts off. I think your trouble is caused by the compressor throwing too much oil out of it and the oil is being held in the condenser and receiver. The 1931 and 1932 Norge compressors had a plate on top of the compressor, held in place by six cap screws. If this plate is installed in the reverse position it causes oil to leave the compressor with the discharge gas. This is because of a baffle arrangement in the compressor which separates the area where the gas and oil leave the compressor discharge tube, and where it leaves the compressor body.

I would suggest you reverse this plate, then allow two or three days for the oil to circulate through the system and back to the compressor in order to determine whether or not this change overcomes your trouble.

OFF CYCLE FLOOD BACK

QUESTION 480: I have a problem on a McCray 8 foot display counter. This counter is connected to a ½ hp. Frigidaire unit, water cooled, and has a coil in both top and bottom. It was originally controlled by a Detroit thermostatic expansion valve, which failed. The owner wrote the factory for a valve, and was sent an Automatic Products thermostatic valve. We changed the old valve, and the suction line began frosting clear to the compressor, which is in the basement. The suction and liquid lines are 18 to 20 feet longer than needed, as the unit is placed in the rear of the basement and could just as well be directly under the counter. We changed the adjustment on the valve until the frost had disappeared from the suction line at the end of the cycle, but it continues to frost at the start of the cycle. This would seem to me to be an off cycle flood back.

The service man from the Power Company came through and changed the power bulb from the end of the last coil, to the last return bend. (We had placed the power bulb in the exact location of the original). This man claimed the last loop of the coil should be used as a drier loop. After this change was made, the pressure switch adjustment was changed to get the proper temperature which makes the Power bills from $4.00 to $6.00 higher per month and also increased the water bills. The drier loop idea seems O.K. to me but why should a sacrifice of coil capacity be made to get this result? (The change in location of the power bulb has not changed the frost back one bit). It seems to us that the drier loop should have been added to the end of the coil instead, and the power bulb left at the end of the coil.

The lower coil is in series with the upper coil and the feed to the lower coil is at the bottom. Would it be of any advantage to change this so as to make the coil feed from the top?

Would you advise the installation of one of the corrective methods as described in the July REFRIGERATION SERVICE ENGINEER to stop this flood back? If so, which of the methods would you suggest and where may we obtain such a device?

The owner claims the suction line did not frost with the original valve. Could this be due to the difference of operation of the bellows type and the diaphragm type of valve? It seems to us this might be true. As we see it, the action of the bellows type would be more gradual whereas the action of the diaphragm valve would be more of a snap action.

ANSWER: It would seem that the cause of your trouble is in the expansion valve itself or in the manner it is installed. In this type of installation there should have been no need of changing the superheat adjustment at all since the factory adjustment should be correct.

You are absolutely correct in that a drier loop is a good idea, but no sacrifice of the effective area of the coil should be made to obtain it. The natural effect of reducing the coil area is to increase the operating cost. I would suggest that the power bulb be moved back to its original position and that a coil of about 6 feet of tubing, the same size as the suction line be added between the point where the bulb is clamped and where the suction line leaves the cabinet. This will prevent the possibility of heat being conducted through the suction line from the outside of the cabinet to the bulb and causing it to open the valve during the off cycle.

There may be some advantage in changing the direction of feed in the lower coil, but I don't think it will have any effect on this particular trouble. Therefore, there is no reason for making the change at this time.

The installation of one of the devices described in the July issue of THE REFRIGERATION SERVICE ENGINEER should not be considered as a corrective means since they do not correct trouble. They are a preventative means against damage to the compressor due to flood-back. Corrective means must also be applied or you will still have improper operation and possible high operation costs.

The difference in types of valves should not be the cause of the trouble because the

Three books

you should have . . . . . .

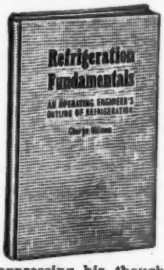
● Every service man, refrigeration engineer or salesman should have these 3 books in his library. Inexpensive and entirely practical they'll help you to earn more by "learnin'" you more.

COMMERCIAL REFRIGERATION and COMFORT COOLING

by S. C. MONCHER

Here is a book that shows you in an easy-to-understand way How to Calculate Refrigeration Loads. The author through his wide experience in the refrigeration field is thoroughly familiar with the problems encountered in the field by refrigeration service and installation engineers, refrigeration equipment salesmen, architects, and others with a general knowledge of the field who are interested in gaining a more thorough understanding of the commercial refrigeration and comfort cooling industries as they exist today.

Price..... **$1.50**



REFRIGERATION FUNDAMENTALS

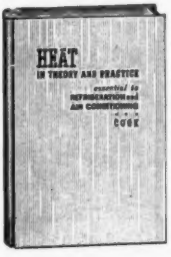
by GEO. HOLMAN

Here's an unusual book that makes the Theory of refrigeration easy to understand. The author is first of all a practical engineer. This book is the text he would have liked to have had when he first started the study of refrigeration, but nothing like it has been available until now. Unlike most authors of books on technical subjects, Holman has an interesting and logical style in expressing his thought. Even if you are already an expert engineer you will enjoy reading his unorthodox explanations, and he will undoubtedly give you a new slant on the subject. If you are just starting the study of the fascinating and complex subject of refrigeration, Holman's unusual book will give you a clearer picture of what you are going to learn.

Price..... **$2.00**

Broaden your understanding of Refrigeration, by learning more about HEAT . . .

In writing this book it has been the aim of the author, Dr. S. R. Cook, to produce a book on heat and its relation to refrigeration and air conditioning, which would be instructive to anyone interested in this field, and at the same time readily readable. The purpose is to give information essential to solution of problems that may arise in the operation of refrigeration and air conditioning machinery or for the student in his study of the science. A portion of the book is given over to definitions of terms used in heat and refrigeration and air conditioning, and to tables of heat constants which will be found very useful.



Price..... **$2.00**

● Above prices are all postpaid. Save yourself some money, all 3 above books $4.50, any two above books $3.00, when ordered at the same time, remittance must accompany order.

Nickerson & Collins Company, *Publishers*

435 N. Waller Avenue

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operating characteristics of both types are sufficiently alike to operate in the same manner. The action of the diaphragm type is just as gradual and just as smooth as the bellows type. There is no snap action.

As I stated before, I believe the trouble is in the valve or the manner it is installed. If the bulb is located on the suction line too close to the point where the tubing leaves the cabinet, heat conducted from the outside may cause an off cycle flooding. The drier loop mentioned will take care of this.

If the orifice size of the valve is too large it may pass too much refrigerant before the bulb has time to re-act and close the valve, thus causing flooding.

There may some foreign matter stuck on the seat of the valve which prevents it from closing. To check this, I would suggest you remove the valve and connect the inlet to an inverted drum of refrigerant. Open the drum valve and permit liquid refrigerant to pass through the valve and blow onto the power bulb. In a few seconds, the liquid refrigerant striking the bulb should cool it sufficiently to cause the valve to close. If the valve does not close tightly stopping the flow of liquid, you may be sure the seat is defective and it is probable you will have to replace the valve.

ON THE REFRIGERATION FRONT

(Continued from Page 15)

The new schedule formalizes existing arrangements whereby all mechanical refrigerator manufacturers, excepting General Electric Company and Frigidaire had received OPA approval of their 1942 model price lists. General Electric and Frigidaire had agreed with OPA to continue to sell at 1941 prices until required data for 1942 model prices was submitted for approval.

The schedule adopts as maximum prices the manufacturers' list prices in effect on February 2, 1942, excepting in the case of General Electric and Frigidaire, as noted above. The 1942 price lists of these two manufacturers are expected to be submitted for OPA approval in the near future.

Situation Tough

. . . — Unfortunately too few refrigeration service men have fully realized the critical situation existing in respect to parts and supplies. Up to this point the securing of materials has not been too difficult, although some delays have been experienced. Right now, stocks on jobbers' shelves are becoming rapidly depleted and the situation can become a calamity if we do not get immediate relief through the repair

WANTED
Used units, compressors, controls, etc. Send itemized list.

One of the largest hermetic rebuilding plants in the United States. Refrigeration units, parts and supplies. General Electric, Westinghouse, Grunow, Majestic, Crosley, Frigidaire, Norge, Kelvinator, and others. Write for catalog on your letterhead.

Service Parts Company
25th Ave. and Lake St., Melrose Park, Ill.

order. It is to the point where many suppliers of refrigeration parts and accessories are accepting only such orders as bear a rating of A-10 or better. Don't overlook the possibility of securing a preference rating on any of your service jobs. Such ratings will help to expedite matters considerably. As one jobber recently put it, service men are realizing that immediate service on many supply parts is a thing of the past for the duration.

R. K. Hanson, New REMA Secretary

. . . — R. K. Hanson, Pittsburg, Pa., secretary of the Refrigeration Compressor Mfrs. Assn. has recently been appointed Executive Secretary of the Refrigeration Equipment Mfrs. Assn.

Refrigerant Drums A Critical Situation

. . . — No steel has been allocated for the manufacturing of new refrigerant cylinders. The situation is serious. The only relief obtainable is to keep refrigerant drums moving, or the industry will face a "bottle neck" when it is necessary to get refrigerant gas. The call is out to round up every available drum, regardless of condition and return them promptly to the jobber. Many of the handicaps you will have to undergo in this present emergency will be of **your own making.** Returning cylinders promptly will **help you to help yourself.**

ONTARIO MAPLE LEAF ANNOUNCES 3RD ANNUAL CONFERENCE

THE Ontario Maple Leaf Chapter made first announcement recently of its 3rd annual service conference and 7th annual banquet and dance to be held March 15 and 16 at the King Edward Hotel in Toronto, Canada.

There will be no exhibits this year, but an interesting program and important discussions will provide a full two-day schedule. All servicemen are urged to keep these dates open.

✕ ✕ ✕

E. E. CONDON TO SERVE ARMY OPERATIONS OVERSEAS

THE New York State Association is regretting the temporary loss of one of its most ardent supporters and members, Ernest E. Condon, who recently enlisted for overseas duty in connection with the United States army refrigeration operations. In announcing his departure to the state association, Mr. Condon wrote, "It is with great regret that I am resigning from the office of Secretary of the New York State As-

RETURN CYLINDERS PROMPTLY TO SPEED DELIVERIES!
There is a serious cylinder shortage. We cannot obtain new cylinders. Prevent delays in your deliveries – by returning each of your empties quickly! Send them back the same day – it will be appreciated.
Cylinder deposits are repaid immediately upon return of your empties.
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sociation to accept a position in connection with the U. S. army operations. My time being too short before sailing to write to each individual I am taking this means of expressing my appreciation of the good fellowship you have all shown me. My assignment with the army is indefinite and I am not in a position to say when I will be seeing you again, but censorship permitting, I do hope to be able to write occasionally, informing you of such activities as I am permitted to write."

There are four men from the eastern states, all members of the Refrigeration Service Engineers Society, assigned to this particular undertaking. Three of them, B. F. Wermuth, who is to be in charge, P. L. Costello and Fritz Harder, are from Syracuse. Mr. Condon is Vice-president of the New York Chapter.

In making the announcement, Mr. Condon stated, "It is not like going with strangers and while I do not personally know the other men with whom I will work in this overseas post, I do feel thoroughly at home with them because I know the type of men usually accepted as members in the RSES. This is just another example of what RSES membership means, even in times of war."

Members of the New York Chapter and the New York State Association join with the many friends of Mr. Condon in wishing him luck in his new undertaking, looking forward eagerly to future news of his safe landing and successful operations.

S S S

R.S.E.S. Chapter Notes

MISSISSIPPI VALLEY CHAPTER

February 3—The annual election of officers was held on this night and after the Nominating Committee had presented their selection, additional nominations were received from the floor. The election got under way with the following results: *President,* H. W. Strohmeir; *Vice-president,* Geo. R. Lindfelt; *Secretary,* Ervin Meyers; *Treasurer,* Fred Tindall; *Sergeant-at-Arms,* Dale Yaap; *Board of Directors,* Frank Weatherly, E. R. Ferguson, D. S. Brainard. Following the election it was moved and duly carried that the chapter hold only one meeting a month in the future, that meeting to be on the first Tuesday of each month.

REFRIGERATION HAS COME A LONG WAY

ANTOINE LAURENT LAVOISIER
1743—1794

1789 A. D.

Antoine Laurent Lavoisier brought order out of chaos by systemizing chemistry and transforming it into a true science. He identified and named certain gases now used as refrigerants—corrected the thinking of his predecessors and opened another path to the science of modern refrigeration.

1942 Virginia Refrigerants today are famed for the unvarying accuracy of their composition—their high quality—their dependability. And today Virginia Refrigerants are doing their share in America's certain progress toward victory.

BUY DEFENSE BONDS & STAMPS

"VIRGINIA" REFRIGERANTS
AGENTS FOR KINETIC'S "FREON-12"
VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

VIRGINIA

CLEVELAND CHAPTER

January 8—Among the correspondence read during the business session was a letter from the Cleveland Civilian Defense office, thanking the chapter for their offer of assistance. On the educational program, Mr. Kimm of Kerotest Manufacturing Company was introduced by the educational director and presented a short talk on manufacturing methods of today. This was followed by a colored movie of Mr. Kimm's recent travels.

January 22—The educational feature of the evening included a brief discussion of the new tubing manufactured by Dow Chemical Company, known as Saran tubing. Following this, Mr. Sawyer, Sales Engineer for Dole Company gave an interesting talk on Dole plates and their application to locker storage plants and trucks.

February 12—A colored movie showing the manufacturing of SO_2 and methyl chloride was presented by Mr. Withers of the Virginia Smelting Company and assisted by Adolph Valley of Innis, Speiden & Co. The questions which followed were answered by Mr. Withers.

February 26—The most important part of this meeting was the election of new officers. A slate was submitted by Elmer H. Weidwald, Chairman of the Nominating Committee and the routine followed the usual procedure with the following results: *President,* Lawrence E. Gardella; *First Vice-president,* Roy McCloskey; *Second Vice-president,* C. R. Olbright; *Secretary,* J. A. Brown; *Treasurer,* R. D. Chown; *Chairman Educational Committee,* J. H. Downs; *Board of Directors,* Warren W. Farr, George J. Schuld, Otto D. Sippel, Walter E. Wright, E. Weidwald; *Sergeant-at-Arms,* Frank Szekula. A suggestion was made that the Educational Committee endeavor to secure Mr. Moore of the OPA for the next meeting.

SOUTHERN OHIO CHAPTER

January 13—During the business session a vote was taken to decide the future meeting night of the chapter and after the ballots were counted the second and fourth Tuesdays of each month became the official meeting nights. On the educational program a picture portraying the right and wrong way to service appliances, both from the sales angle and the customer's point of view, was shown by R. Hissam. The meeting found this to be a very educational presentation and decided that it illustrated some

Worth looking for

THE sure way to get gauges and dial thermometers that will meet today's heavier responsibilities is to look for the name MARSH.

In the first place Marsh Instruments offer you every measure of accuracy and stamina that can be packed into a case, because Marsh has the know-how that comes from 75 years of gauge making. But that isn't the only reason. Beyond this basic perfection, Marsh alone offers the Marsh "Recalibrator", the only real defense against the jars and jolts of hard service for years to come.

The "Recalibrator" is available in all Marsh Gauges, standard in Marsh Dial Thermometers. It is typical of the many refinements you will find throughout the broad Marsh line. Write for the big refrigeration catalog.

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2059 Southport Ave., Chicago, Ill.

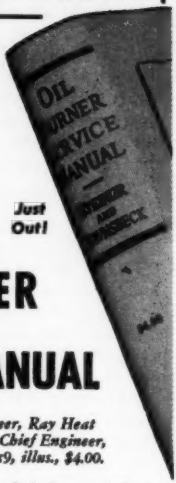
Any gauge can be roughhandled out of adjustment. However, if it's a Marsh "Recalibrator" Gauge, the twist of a screwdriver reestablishes the proper relation between the bourdon tube and the gauge movement — makes the gauge accurate again at every point on the dial.

MARSH

Refrigeration Instruments

How to analyze and correct troubles of any type oil burner *DOUBLE-QUICK*

Today's money-making opportunities in oil burner servicing are keyed not only to how well the work is done but how fast. With this practical book you can locate, diagnose and correct all operational and constructional troubles of any type or recognized make burner without delay or doubt — and thus increase earnings.



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OIL BURNER SERVICE MANUAL

By K. Steiner, Consulting Engineer, Ray Heat & Power Co., and F. Ravnsbeck, Chief Engineer, Ace Engineering Co., 365 pp., 6x9, illus., $4.00.

▶ Gives the mechanic just the help he needs in installing and servicing oil burners, in plain language. Exhaustive treatment given to domestic burners, including all recognized makes from earliest to current types. Commercial and industrial installation, maintenance and service are thoroughly discussed and illustrated. Gives countless pointers secured from men actually engaged in handling various burners and accessories.

C. H. CHALMERS
Pres., Chalmers Oil Burner Co.; Former Pres., American Oil Burner Assn., says, "No one installing or servicing burners should neglect to read this well-written and informative manual."

16 CHAPTERS COVER

- Domestic Pressure-atomizing Oil Burners.
- Domestic Vertical-cup Burners.
- Rotary Wall-flame Burners.
- Low-pressure Atomizing Domestic Burners.
- Miscellaneous Domestic Burners.
- Horizontal-rotary Oil Burners.
- Miscellaneous Industrial Oil Burners.
- Refractories.
- Tanks and Piping.
- Relays and Circuits.
- Automatic Control Instruments.
- Boilers and Warm-air Furnaces.
- Load and Burner Capacity.
- Draft and Control, Efficiency and Testing.
- Preheating.
- Service.

The Refrigeration Service Engineer
433 N. WALLER AVE.
CHICAGO, ILL.

of the faults of service methods more clearly than any other method could. The wind-up of the meeting took the form of a good old-fashioned "bull" session, thoroughly enjoyed by everyone.

February 10—A discussion took place on future educational programs in which many good suggestions were offered to the educational committee. The program of this evening consisted of an explanation of the construction and operation of the G.E. Deluxe Cold Control given by R. Steiner.

MOUNT ROYAL CHAPTER

January 23—The great part of the evening was taken up with the election of officers and after the Nominating Committee had made known their choice it was moved and seconded and duly passed that the slate as presented by the Nominating Committee be unanimously elected. This slate is as follows: *President*, J. Bruno Lacerte; *First Vice-president*, J. M. Turner; *Second Vice-president*, J. A. St. Laurent; *Corresponding Secretary*, A. W. Dancey; *Recording Secretary*, Jos. Galley; *Treasurer*, Philip Tremblay; *Sergeant-at-Arms*, Adrien Gravel; *Educational Chairman*, Gordon O. Roe; *Board of Directors*, R. McCullough, J. D. Ross, C. A. Fabien, L. J. Boucher, J. A. Tremblay.

ONTARIO MAPLE LEAF CHAPTER

February 13—The educational feature of the evening included a talk by Mr. McDowell of the Accident Prevention Association. Mr. McDowell was introduced by Bill Marshall after which he related much of his experience with the Hostess Corp. Later on he presented a picture entitled "The Warning" which portrayed the various safety groups organized by the British government in England prior to the outbreak of the present war. It dealt briefly with the battle for Britain. The picture proved most interesting inasmuch as it gave a general idea of the various precautions necessary to insure the safety of civilians. The balance of the evening was spent in a general discussion of the activities of the Interprovincial Chapter and plans for the forthcoming annual convention. During the latter part of the evening the subject turned to the matter of the rationing of tires and gasoline which the members are now facing.

February 27—Mr. Wood read a letter received from the Secretary of the government Advisory Committee, advising the chapter

that they were not authorized to appoint new members to the committee, but extended an invitation to Harry Parish to be present at the next meeting. A Nominating Committee of approximately nine members was appointed with instructions to bring a slate of new officers for the next meeting. Visitors welcomed to the meeting included Allan Kay, one of the members, who has since joined the Royal Canadian Navy. The speaker of the evening introduced by the Secretary was Mr. Tom Fleming of the Kester Solder Company, who gave a general idea of the importance of tin in relation to various alloys and then put on a demonstration on how to determine the quality of various metals and alloys.

BOSTON CHAPTER

January—The annual election of officers was held at this meeting and after following the usual routine of such elections, the results were as follows: *President,* Gerald S. Bradford; *First Vice-president,* A. O. Alexander; *Second Vice-president,* W. E. Daisy; *Secretary,* Charles C. E. Harris; *Treasurer,* B. Stenmark; *Sergeant-at-Arms,* W. E. Jones; *Educational Chairman,* Roger Fuller; *Board of Directors,* J. L. Hall, Norman C. Honecker, S. J. Ashe, M. P. Handspicker, Hugh Redick.

February 10—A. C. Homeyer, of Ranco, Inc., was the speaker for the evening. He was introduced by the Educational Chairman. Mr. Homeyer gave a most interesting talk on controls and it was generally conceded by the group that it was the best talk they had had for many a month. Harold Walker, Chairman of the Entertainment Committee, advised the meeting that arrangements for the annual banquet were going forward satisfactorily and that the banquet would be held on the 10th of March at Gustie's Restaurant in Cambridge.

DAYTON CHAPTER

February 12—Almost the entire meeting was spent in a discussion of the present materials situation and the effects on the members of tire rationing. In addition, however, some very interesting things were brought out, for instance, the discussion turned to the advisability of giving priority to service calls. In other words, it was felt that preference to a call in which the machine was completely down over that for a minor complaint should be given. It was also suggested that all defective parts replaced should be saved for possible future repair.

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HIGHSIDE CHEMICALS CO., NEWARK, N. J.

February 26—On the educational program of this evening Mr. Brock gave a very interesting and informative talk on servicing of Norge Refrigerators. Mr. Brock is well qualified to handle this subject, inasmuch as he is the local authorized Norge service man.

TRI-STATE CHAPTER

January 6—The president appointed a Nominating Committee, instructing them to make their selection of officers for the coming year and present it at the next meeting. A discussion on the war's effect on refrigeration and the reading of various bulletins on the matter occupied an interesting period of the evening.

January 27—After the preliminaries of the business session were dispensed with the annual election of officers got under way with the following results: *President,* Donald M. Young; *First Vice-president,* A. W. Albertsen; *Second Vice-president,* Monroe Chase; *Secretary,* Joe H. Campbell; *Treasurer,* Claude A. Brunton; *Sergeant-at-Arms,* L. G. McClure; *Board of Directors,* Monroe Chase, James Cottle, T. A. Horne, Donald Workman, A. W. Gruber; *Chairman Board of Advisors,* Roy McElhaney. The election was followed by a lengthy discussion on priorities, government regulations, tire rationing and other related subjects. Following the meeting, Mrs. Albertsen, at whose home the meeting was held, served refreshments very much enjoyed by everyone in attendance.

MILE HIGH CHAPTER

January 12—Mr. McCombs presented his interpretation of the various orders issued by the War Production Board. It was felt that this subject is of such vital interest to the chapter that the educational committee should, in the future, make it its business to keep informed on these orders and present a digest of them at the meeting each month. It was suggested that the members have signs painted on all service trucks, designating the member as engaged in emergency service. This, it was pointed out, would help in impressing the public with the importance of refrigeration. Inasmuch as the Fire Department is scheduled for a first aid demonstration for the next meeting, Mr. Hemphill was asked to study Bulletin No. 8 issued by the national office and to present a discussion along its lines at the same time as the first aid demonstration.

February 9—The matter of having a uniform sign made by the chapter for all mem-

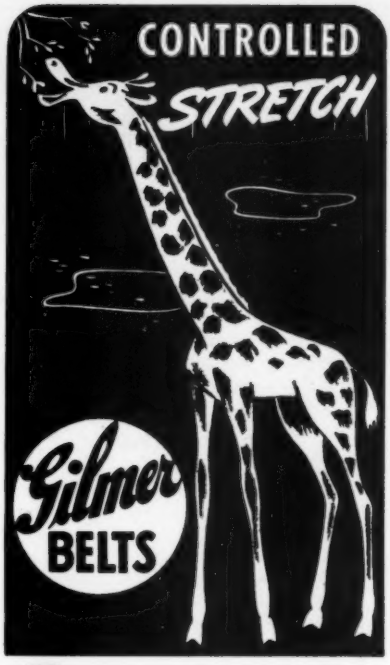
bers' trucks and cars, designating them as emergency vehicles was discussed at some length and Messrs. Martin and McCombs were delegated to draw up a sketch of the signs and submit it for approval. The secretary was instructed to write each member asking for his opinion and determine whether he would be interested in such a movement. On the educational program the rescue squad of the Denver Fire Department put on a very fine demonstration. It included the different types of gas masks used in rescue work. These masks are intended for protection in cases of ammonia, methyl chloride or sulphur dioxide leaks. The demonstration also included artificial respiration with almost everyone seeking a suitable victim on whom to practice. Mr. Hemphill followed the demonstration with a discussion on safety measures to be taken in refrigeration service work. The general questions and answers which followed brought out several worthwhile points.

LOS ANGELES CHAPTER

January 21—During the first part of the evening brief but informative talks were given by Carl Lindberg and Frank Gillett on the subject of priorities. Their interpretations served to bring the members up to date on recent orders from Washington. The annual election of officers took place during the evening with the following results. *President,* W. C. Irving; *First Vice-president,* C. O. McClellan; *Second Vice-president,* John Lewis; *Secretary,* D. W. Irving; *Treasurer,* Graham R. McLay; *Sergeant-at-Arms,* W. B. Decker; *Board of Directors,* W. W. Allison, Paul Kieffer, J. C. Rodgers, Frank Gillett, P. H. Askew; *Educational Committee,* J. C. Blair, E. Nelson. After the election W. W. Allison took charge and the installation of officers followed.

TWIN CITIES CHAPTER

February 3—A general discussion on recent priority orders from Washington was had with various ones giving their personal interpretations. Considerable time was also devoted to the tire situation and its effect on the service industry. Harry Schaefer suggested that the chapter secure a man from the War Production Board office to attend a future meeting and answer questions regarding interpretations of priority orders. President Palen was asked to appoint a committee of one who would make this contact with WPB and see if arrange-



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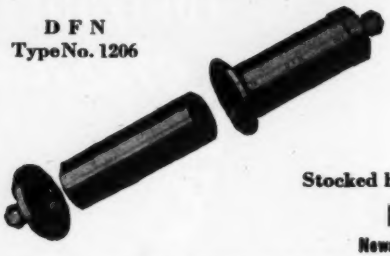

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ments could be made. The door prize for the evening was paid in defense stamps. Ernie Erickson was the winner, receiving $1.00 in stamps.

ROCKFORD CHAPTER

February 2—The educational feature of the evening took the form of a demonstration on the Stewart Warner. This demonstration proved highly educational and was thoroughly enjoyed by all. A buffet luncheon was served following the meeting.

February 16—The entire meeting was devoted to business matters of the chapter and to a discussion of a forthcoming dance to be held in Rockford. No educational program was included.

PITTSBURGH CHAPTER

February 16—Apart from the business conducted during the evening, the entire informative period was devoted to a discussion on the tire situation and other rationing orders as they affect the refrigeration industry. Mr. Horner, of Williams & Company, provided an interpretation of order P-100 which proved very helpful to those who were unable to get the full importance of this order.

TOLEDO CHAPTER

February—The meeting took place at Redman's Hall and was called to order by President Dale Moog. Some discussion took place regarding the expense account for flowers which had been sent to members in the past. It was voted that five per cent of the treasury should be set aside as a contingent fund to be used as the directors decided. Two committees were appointed by the president, first, the Entertainment Committee headed by Elliott LaFayette, and second, the Educational Committee headed by C. N. Bordner.

ST. LOUIS CHAPTER

January 8—The major part of the evening was devoted to business of the chapter and discussion of future programs during the coming year.

January 23—After opening the meeting, it was immediately turned over to the Educational Chairman who introduced Mr. G. Wegner of the Penn Electric Switch Company. Mr. Wegner then introduced R. C. Luscombe of the company who talked on the new "Avrgaire" Penn control. He illustrated his talk with slides which greatly

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helped in the explanation. Many questions were asked from the floor which added to the information originally given.

KANSAS CITY CHAPTER

February 10—In an effort to evenly allocate the work of the chapter, a motion was made and duly passed that the First Vice-president take charge of the educational work, the Second Vice-president take over the entertainment work and the Sergeant-at-Arms keep the cost records. In addition to these men being in charge, Vice-president Meeker appointed Messrs. Tramposh, Thompson and Cox to serve on the Educational Committee, and Vice-president Cox appointed Messrs. Brown, Andrews and Hataway to serve on the Entertainment Committee. These committees rounded out the personnel of the officers who were elected at the previous meeting. These officers are: *President,* F. C. Smith; *First Vice-president,* R. E. Meeker; *Second Vice-president,* R. F. Cox; *Secretary,* A. M. Hoover; *Treasurer,* E. K. Farthing; *Sergeant-at-Arms,* W. A. Brown; *Board of Directors,* J. P. DeWilde, T. L. Anderson, Charles Wells.

TRI COUNTY CHAPTER

January 9—After an enjoyable steak dinner, the business meeting was opened. The attendance prize of $4.60 went to A. E. Wolff. This was an accumulation from several meetings. President Anderson appointed Willis Stafford, L. P. Millen and A. E. Wolff on the Nominating Committee and while they made their selections, business of the chapter was conducted. During the latter part of the meeting the Nominating Committee had presented their report and further nominations from the floor had been received. The election got under way and the results are as follows: *President,* B. V. Clark; *Vice-president,* N. H. Rust; *Secretary-Treasurer,* Clarence Stumpf; *Sergeant-at-Arms,* Wm. McCarley; *Board of Directors,* Fred Johansen, L. P. Millen, Harold Anderson.

January 23—The president made appointments of committee chairmen which included, Willis Stafford, Educational Committee; Fred Johansen, Entertainment Committee; Arthur Anderson, Membership Committee. After the meeting had been closed the membership viewed a travel picture entitled, "The New Oregon Trail."

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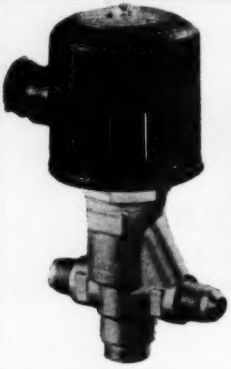

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February 20—The meeting was held at the Delmonica Cafe in Elgin. The attendance prize was drawn by Art Wolff. On the educational program, Mr. Habener of the Minneapolis Honeywell Corporation presented their line of new simplified controls. A resolution was drawn up and adopted at this meeting offering the services of the chapter and its members to the Chairman of the Illinois Council of Defense.

Ladies Auxiliary

ILLINOIS VALLEY AUXILIARY

January 16—The meeting was opened with the pledge of allegiance to the flag. Plans for a Smorgasbord party were made, after which the meeting adjourned and was turned oved to the hostess, Mrs. McGill. The entertainment consisted of "Pinochle" and the prizes were won by Mesdames Harris, Luckert and Sackey.

February 13—At this meeting the ladies voted to hold meetings every four weeks instead of every two which has been the past practice. After the meeting, lunch was served with the men in attendance in the Tropics Room of the Jefferson Hotel.

ROCKFORD AUXILIARY

At the January 19th meeting, after a lengthy discussion on the matter, a motion was made and duly passed that the auxiliary buy a $25.00 defense bond. Mrs. McCarthy was instructed by the auxiliary to draw the money from the bank and purchase the bond. After various other business matters had been settled, the balance of the evening was spent in playing "Crazy Bridge" with Mesdames Shipman, Sturch and Larsen winning the prizes.

February 2—After business matters had been settled, the balance of the evening was spent in playing "Knock, Knock Rummy." Mesdames Kruse, Overman and Larsen won the prizes.

February 16—Business matters occupied the first part of the evening and the balance was spent in games with Mesdames Shipman, Sturch and Larsen winning the prizes.

TRI STATE AUXILIARY

The February meeting was held in the home of Mrs. Claude Brunton and after a brief business session, Mrs. Brunton served a delicious lunch to both the ladies and men.

KANSAS CITY AUXILIARY

January 13—Considerable business was transacted during the first part of the evening, then the meeting turned to discussions of work for the current year and a pledge was made to give as much time as possible to aid Red Cross work.

January 27—After the business session the evening was spent in preparing of sacks for the making of dish towels.

February 10—The meeting was held in the home of Mr. and Mrs. Smith and the entire time was spent in the transaction of the auxiliary's business.

MISSOURI VALLEY AUXILIARY

January 8—The auxiliary met at the home of Mrs. Flohr. Games were played and refreshments served, and a good time was had by all.

January 22—The meeting was held in the home of Mrs. Doyle. The business session included a decision to contribute a prize to the national convention to be held in Chicago. After the meeting adjourned the members surprised Mrs. Flohr with a stork shower. Refreshments were served by the hostess.

WEATHERHEAD SALESMEN TOUR UNITED STATES AND CANADA

CASTING aside the generally accepted practice of conducting a convention of his sales representatives in a single city, G. R. Whippo, sales manager of Weatherhead's Jobbing Division, took his sales force to all the Weatherhead plants.

The five days' activities began with a general meeting of company executives and salesmen on Monday morning, January 19. A. J. Weatherhead, Jr., company president, welcomed the group and sounded the keynote of the five day session when he emphasized the company's ability to produce its products. "Never," said Mr. Weatherhead, "was the company in better position to produce, produce, and keep on producing. Too many persons," he emphasized, "are looking for barriers to sales. There have always been barriers to sales," he said, "but the salesman with the right kind of backbone could and would find ways to overcome these barriers. With a very large part of the production of all our plants engaged in defense work," explained Mr. Weatherhead, "the company still expected to be able to take

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care of its regular customers without too much difficulty, but winning the war came first, last and always in the company's plans." Personally conducted tours of the Weatherhead Cleveland plant, which employs 2,000 workers, were evidence to the group of the immense volume of production now being turned out in this plant.

John Love, columnist on The Cleveland Press, was the principal speaker at the evening meeting which completed the first day.

Tuesday's sessions were devoted to discussions by Weatherhead executives and department heads on priorities, new products, sales promotion and advertising.

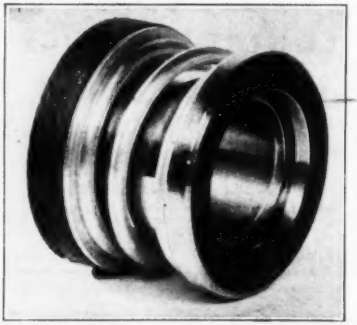
But generalissimo Whippo knows that "all work and no play makes Jack a dull boy," so entertainment was the order for the evening. Since Wednesday would see the group in Columbia City, Indiana, two special Pullmans were soon occupied by the group on Tuesday night for transportation to Weatherhead's Indiana plant, the Columbia Products Co. A waiting bus at Ft. Wayne quickly covered the miles to Columbia City, where Weatherhead's plant in this location was visited. Here M. V. Lowe, manager of the Columbia City plant, was host to the visiting salesmen, with a welcome to the city extended by Mayor James Brown and several city officials.

Canada Next

Leaving Columbia City that night by bus, the group entrained again at Ft. Wayne for St. Thomas, Ontario, Canada, to inspect the company's new Canadian plant.

The skirl of bagpipe and the rattle of the snare drum greeted the visitors when they arrived in St. Thomas. "Welcome Weatherhead" signs on the city hall and Grand Central Hotel were pleasant greetings to the tourists who spent several hours in getting acquainted with the plant of The Weatherhead Company Ltd. Under the guidance of N. E. Kilmer, manager and secretary of the plant, they inspected one of the most modern industrial plants in Western Ontario.

The plant visit was followed by a banquet in the evening where Mayor George T. Dyer officially welcomed the visitors. M. F. Hepburn, Premier of Ontario, gave the address of the evening and roused his audience to high enthusiasm with his enlightening talk on war conditions in Canada. Members of the city council, Chamber of Commerce ex-



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WEATHERHEAD SALESMEN AS THEY WERE ON TOUR

In the upper left the convention is shown as an evening session gets under way. Upper right they are shown in front of Weatherhead plant, St. Thomas, Ont., Can. In the lower left—Ready to go in Cleveland. Lower right—Arriving in Columbia City, Indiana.

ecutives, and other business and professional men attended the function as guests.

Banquet over, the skirl of the bagpipe and rattle of the snare drum sounded again as a signal to entrain for Cleveland via Detroit.

To conclude the five day session, voted "the best sales convention ever" by the entire group, prizes were awarded by G. R.

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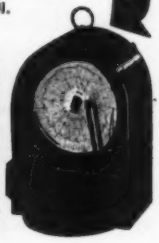

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COOLING and FREEZING UNITS
C H I C A G O

Whippo for 1941 sales accomplishments to four outstanding salesmen at a luncheon in Cleveland on Friday. The prize winners were "Landy" Landwerlen, Michigan; Ross Gould, California; Dick McDowell, Pennsylvania; and Bill Minnick, Southern territory. In addition to the prize awards, A. J. Weatherhead, Jr., presented each winner with a gold trophy.

PENN ADVERTISING PROMOTES INDUSTRY

IN spite of the fact that a large part of its capacity is being devoted to war production, the Penn Electric Switch Co. of Goshen, Indiana, manufacturers of automatic controls, is maintaining its advertising contacts with the industries it serves on an even more extensive basis than before. In addition to this, Penn is carrying on a general advertising program in behalf of those industries, emphasizing their contribution to the Nation's morale and war effort.

Commenting on the advertising plans of his company for 1942, John R. Netedu, Advertising Manager, said:

"Naturally our engineering resources and production facilities are being devoted largely to work for our armed forces. However, modern war depends so much upon civilian support of the men on the actual firing line, that the health and morale of the people are vital to success. For this reason the Penn management has recognized the importance of helping to sustain the industries which Penn serves in peace times, among the most important of which are the heating and commercial refrigeration industries.

"Because automatic heating and commercial refrigeration are so important, Penn is, first of all, doing its best to continue supplying the automatic controls required for the operation of equipment in these fields. And even though the demand for controls will probably exceed the number we shall be able to manufacture, Penn feels it important and necessary to maintain its contact with manufacturers, dealers and service men by means of advertising. It is for this reason that our schedules in the various trade fields which we serve have not only been maintained but in some cases substantially increased.

"In addition we are carrying on a general campaign, directed to the executive leadership of our country, emphasizing the vital service of such basic industries as commer-

cial refrigeration and automatic heating in time of war as well as in peace. There is great necessity now for straight thinking and proper evaluation of the many factors in our industrial set-up. Hence our full page advertisements appearing every four weeks in Business Week, are being devoted, not to the subject of Penn controls, but to the vitally important service of automatically controlled equipment in various industries.

"For this reason we feel that Penn advertising is a contribution to the national welfare as well as an additional support to industries which are important to our war effort."

Changes in Personnel

R. H. Luscombe, Sales Manager of Penn Electric Switch Company, announced recently several personnel and other changes in district offices.

Harvey M. Olmstead has been appointed the company's representative with an office at 1708 Sixteenth Street, Denver, Colorado. He will handle the sales work of all Penn products in the Denver area.

Howard C. Shilling is now manager of the company's Moline, Illinois branch office to replace J. G. Moravec who has been called to active service. Until his appointment, Mr. Shilling represented Penn in the Chicago territory. Mr. Moravec has been given a leave of absence and is now a First Lieutenant with Army Corps of Engineers.

Penn's Chicago office has moved from 844 Rush Street to 520 North Michigan Avenue. Telephone numbers remain unchanged, namely, Superior 0726 and 0727. Mr. E. B. Maire is in charge.

X X X

BRUNNER ISSUES SERVICE MANUAL

THE Brunner Manufacturing Company, Utica, New York, has released a new service manual covering the essential details common to all refrigerating systems in addition to specific instructions on Brunner compressors.

The book contains 115 pages of factual information regarding the operation and servicing of the various components that go to make up a complete refrigeration installation; trouble diagnosis, with cause and method of correction, both electrical and mechanical.

It is well illustrated and is bound in a black loose leaf binder which will permit future additions. The price is $2.50.

USE

DRIERITE

FOR DRYING AIR REFRIGERANTS INDUSTRIAL GASES

DRIERITE is an Efficient, Rapid, Economical Dryer for all the Modern Refrigerants. Dries both by Chemical Action and Adsorption.

Used in Dehydrators by leading manufacturers and furnished to the Service Engineer by leading Supply Dealers.

Write for literature.

W. A. HAMMOND DRIERITE CO.
YELLOW SPRINGS, OHIO

COLD CONTROLS & EXPANSION VALVES
repaired or exchanged
at the following prices, F.O.B. Chicago

Automatic Expansion Valves (All Makes)	$1.50
Thermostatic Expansion Valves	3.25
Automatic Water Valves	2.50
Domestic Cold Controls (Modern Type)	2.50
Commercial Controls (Temp. or Pressure)	2.75
Commercial Dual Controls	3.25

ALL WORK GUARANTEED FOR 90 DAYS
Write for quantity prices
NEW DUTY
2424 Irving Park Blvd., CHICAGO

Classified Ads
Rate: Two Dollars for fifty words or less. 30 cents for each additional ten words or less.

HELP WANTED—Service and Installation men on commercial work for Cleveland territory, weekly or hourly rate. Write Box 116, REFRIGERATION SERVICE ENGINEER, 435 N. Waller Ave., Chicago.

ELECTROLUX units and parts exchanged, units (4x5 cubic) less controls $19.50, Burners $1.25, Thermostats $2.50, water and gas cocks 50c each, sylphons, generator water temp. controls $2.50, strainer and pres. reducer $2.50. Write for quantity prices. Most parts and units shipped same day. All prices f.o.b. Edison Cooling Corporation, 310 E. 149th Street, Bronx, N. Y.

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KEY to Our SERVICE

LARGE STOCKS

Careful attention to your orders for

REFRIGERATION and Air Conditioning PARTS and Supplies

THE HARRY ALTER CO.
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3 CHICAGO BRANCHES, NORTH, WEST, SOUTH

NEW YORK · PHILADELPHIA · BRONX · JAMAICA · NEWARK · DETROIT · CLEVELAND · ST. LOUIS

YOU CAN'T DENY IT!

BETTER DRYING AGENT BETTER JOB!

That's logic. And—with your 1942 responsibility—you can't afford to use a drying agent that hasn't proved its superiority! Davison's Silica Gel has won its position as the industry's preferred drying agent on this one point—IT DOES A BETTER JOB! Service engineers and manufacturers alike say that Silica Gel's capacity, speed, acid removal and freedom from dusting is helping them keep America's refrigerators running — has helped them eliminate the break-downs caused by moisture.

If you've never used Silica Gel, you have an experience coming to you. Try it and see for yourself how it fits in with your plans to do your part in Civilian Defense.

Your Jobber stocks Silica Gel charged dehydrators and Silica Gel in bulk.

✓ KEEP 'EM RUNNING WITH DAVISON'S SILICA GEL

SILICA GEL

MOISTURE MASTER

THE DAVISON CHEMICAL CORPORATION

SILICA GEL DEPARTMENT

BALTIMORE, MARYLAND

BONNEY TOOLS

New! No. 49 TuType Wrench Set

Designed Especially for Refrigeration Service

BONNEY TuType Wrenches are ideal for servicing all types of refrigeration equipment.

Combining, as they do, an open end and box wrench in the same tool—each with the same size opening—permits using the end most applicable to the job at hand.

The No. 49 Set contains five Bonney TuType Wrenches with $\frac{7}{16}$", $\frac{1}{2}$", $\frac{9}{16}$", $\frac{5}{8}$" and $\frac{11}{16}$" openings in a handy leatherette roll.

Bonney TuType Wrenches are drop forged of Bonaloy Steel, heat treated their entire length and heavily chrome plated to give a lasting rust-proof finish. The box-end has double hexagon opening with head at an angle of 15° to give proper clearance, while the open end is placed at a 15° angle for efficiency. Handles are long, thin and oval-shaped, affording a firm, comfortable grip.

Your refrigeration supply jobber carries Bonney TuType Wrenches in stock. See him or write for catalog covering the full line of Bonney Tools.